THE

EDINBURGH

NEW DISPENSATORY:

CONTAINING

I. The ELEMENTS of PHARMACEUTICAL CHEMISTRY.

II. The MATERIA MEDICA; or The NATURAL, PHARMACEUTICAL, and MEDICAL HISTORY, of the DIFFERENT SUBSTANCES EMPLOYED in MEDICINE.

III. The PHARMACEUTICAL PREPARATIONS and COMPOSITIONS.

INCLUDING

Complete and Accurate Translations of the Octavo Edition of the London Pharmacopœia, published in 1791; Dublin Pharmacopœia, published in 1794; and of the New Edition of the Edinburgh Pharmacopœia, published in 1805.

Illustrated and explained in the Language, and according to the Principles, of MODERN CHEMISTRY.

With many NEW and USEFUL TABLES; and Several Copperplates, explaining the new System of Chemical Characters, and representing the most useful Pharmaceutical Apparatus.

By ANDREW DUNCAN, Jun. M.D.

Fellow of the Royal College of Physicians and Royal Society of Edinburgh, and Associate of the Linnean Society of London.

THIRD EDITION.

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TO

ANDREW DUNCAN, M.D.

PROFESSOR OF THE INSTITUTIONS OF MEDICINE
IN THE UNIVERSITY OF EDINBURGH,

THIS WORK

IS MOST DUTIFULLY AND AFFECTIONATELY INSCRIBED,

BY

HIS SON.

PREFACE

DR. LEWIS published the first edition of his *New Dispensatory* in 1753. The principal part of the work was a commentary upon the London and Edinburgh Pharmacopœias, of both of which it contained a complete and accurate translation. A concise system of the Theory and Practice of Pharmacy was prefixed, as an introduction; and directions for extemporaneous prescription, with many elegant examples, and a collection of efficacious, but cheap remedies, for the use of the poor, were added às an appendix.

The manner in which the whole was executed, placed Dr. LEWIS at the head of the reformers of Chemical Pharmacy; for he contributed more than any of his predecessors to improve that science, both by the judicious criticism with which he combated the erroneous opinions then prevalent, and by the actual and important additions he made to that branch of our knowledge. He was justly rewarded by the decided approbation of the public. During the author's lifetime, many editions were published, each succeeding one receiving the improvements which the advancement of the sciences connected with Pharmacy suggested.

After the death of Dr. LEWIS, Dr. WEBSTER and Dr. DUNCAN successively contributed to maintain the reputation of the work, by taking advantage of the discoveries made in natural history and chemistry; and by making those alterations which new editions of the Pharmacopœias on which it was founded rendered necessary. From the place of their publication, and

to distinguish them from the original work of Dr. LEWIS, which was still reprinted, without alteration, in London, these improved editions were entitled, *The EDINBURGH New Dispensatory*.

When the Edinburgh Collge some time ago determined to publish a new edition of their Pharmacopœia, the booksellers who published the copy-right of that work, were desirous it should be accompanied by a corresponding Dispensatory. Indeed, since the year 1788, when my father revised it, it had undergone no material alteration, although it has been often reprinted with the name of another editor. During that period the progress of chemistry, pharmacy, and natural history has been so great, as to render a complete reform absolutely necessary. This, to the best of my abilities, I have attempted; and how great and important the alterations have been, will appear from the following analysis.

The general plan of the work remains the same. It is divided into three parts. The first contains Elements of Pharmacy; the second, the Materia Medica; and the last, the Preparations and Compositions.

The *first* of these is entirely new, nothing being retained but the title. It is divided into two sections. The first contains a very concise account of some of the general doctrines of *Chemistry*, and of the properties of all simple bodies, and the generic characters of compound bodies. In the second part, the *Operations of Pharmacy*, and the necessary apparatus, are described; and an Appendix is added, containing many very useful tables, and the explanation of the plates.

The principal addition to the second and third parts of this work, is the introduction of a complete translation of the excellent Pharmacopœia of the Dublin college,* which has never

* Since the publication of the first edition of this Dispensatory, I have learned that the introduction of this translation was incorrect, as the original was not a published work, but printed only for the inspection of the friends of that college. The error was unintentional, and has, I trust, not derogated from the reputation of the Dublin college, while it has certainly promoted the object they had in view, the improvement of pharmacy.

appeared before in the English language. I therefore trust, that it will be found an important and valuable addition. In Ireland, in particular, it must give the *Edinburgh New Dispensatory* an interest which it did not formerly possess.

The *second part* contains the *Materia Medica*, arranged in alphabetical order. The alterations in this part are also very considerable. I have adopted the nomenclature of the Edinburgh college, or rather of natural history, in preference to the officinal names hitherto employed. To the systematic name of each article are subjoined its synonymes in the different Pharmacopœias, and the designations of the parts used in medicine; then the class and order of natural bodies to which it belongs; and if a vegetable, the exact number of its genus and species, according to the excellent edition of LINNÆUS's *Species Plantarum*, now publishing at Berlin, by Professor WILLDENOW.

The ancient practice of naming medicines from their inventors or supposed virtues, has been for some time exploded from our Pharmacopœias; but it has been long customary to describe both simple substances and their preparations or compositions, by what are generally termed Officinal names, in contradistinction to the present systematic names of the same substances. But their officinal names are in fact the old systematic names, which were unaccountably retained for the denomination of medicinal substances, after the improvements in natural history and chemistry rendered the introduction of a new nomenclature into these sciences necessary.

Attempts have been made, both in this country and in Germany, to introduce the language of chemistry into pharmacy; but these attempts, however useful, were but feeble and incomplete. The honour of being the first to compose a Pharmacopœia in the pure and unmixed language of science, belongs indisputably to the Royal College of Physicians of Edinburgh, in the beginning of the nineteenth century. To this innovation many objections have been made, but they rather apply to the

necessary imperfections of a first attempt, than to the principle itself, the propriety of which can scarcely be doubted, when we consider that Materia Medica and Pharmacy are but an application of Natural History and Chemistry to a particular purpose. If the general principle be admitted, it naturally follows, that the names of all substances employed in medicine should be the same with the names of the same substances, according to the most approved systems of Natural History and Chemistry; and that the titles of compound bodies should express as accurately as possible the nature of their composition.

Considerable difficulties, however, occur, in attempting to form a nomenclature in strict conformity with these principles. The most apparent of these is, that the titles of the more compounded medicines would become too verbose and inconvenient, if they were to express every ingredient, although of little importance. The college, fully aware of this difficulty, have therefore contented themselves with indicating in the titles the principal ingredients only, on which their powers and uses seem to depend; and when it was necessary to introduce more, or to add the epithet *compositus*, they have endeavoured to abbreviate them systematically. For the same reason, they have prescribed some well-known simples in very frequent use, by their common names, such as *Opium*, *Manna*, *Moschus*, *Castoreum*, thinking it sufficient to have pointed out in the catalogue of the Materia Medica the animals and vegetables from which they are obtained.

In most cases, it is proper to mention both the generic and specific names of simples; but where it is necessary to point out even the variety employed, it will be in general more convenient to omit the specific name, and to retain those of the genus and variety, as *Aloes Socotorina* for *Aloes perfoliata Socotorina*, *Crocus Anglicus* for *Crocus sativus Anglicus*. Also when any substance is obtained indiscriminately from several species of the same genus, the specific name may be omitted with propriety. Thus, it is sufficient to say, *Resina pini*, *Oleum volatile pini*, &c.

Another difficulty arises from the reformers of chemical nomenclature not having pointed out the manner of expressing certain, and these very common, forms of combination, without employing a periphrasis totally incompatible with the brevity of a name. Pharmaceutists have therefore been obliged to supply this deficiency from their own store.

The Edinburgh College have accordingly retained some titles, such as *Tincture* and *Spirit*, which, although not strictly chemical, have been long received in Pharmacy, and are so well understood and defined, that they can lead to no error or ambiguity.

The principles, therefore, upon which the Edinburgh College have established the new nomenclature which they have introduced into Materia Medica and Pharmacy, appear to be so rational and scientific, that it can scarcely fail to be generally adopted. As science advances, its imperfections will be remedied, and its deficiencies supplied; for, besides other advantages, it facilitates remarkably the application of discoveries and improvements in Natural History and Chemistry, to the purposes of medicine.

In other particulars, considerable additions have been made to the natural history of the different articles, to the means of distinguishing them from other substances with which they are apt to be confounded, and of detecting frauds and adulterations. Almost every thing which regards their chemistry is entirely new. As from the principal list every article has been excluded which is not contained in the Materia Medica of at least one of the British Colleges, I have given, in an Appendix, a very concise account of such other articles as possess a place in some respectable foreign Pharmacopœias. I have also added lists of the Medicinal Simples, arranged according to the best systems of Natural History.

The *third part* contains the *Preparations and Compositions*.

In the general arrangement of these, I have not followed any of the Colleges exactly, although I have not deviated much from that of the Dublin Pharmacopœia. It is not of very great

importance in what order the classes or chapters be arranged; but these classes should be natural, and, if possible, established on one general principle. Unfortunately, however, in most Pharmacopœias, some of the classes are founded on chemical analogy, and others on the similarity of form, or mode of preparation; and what is still worse, some are entirely anomalous and unnatural. The last error I have carefully endeavoured to avoid, but I have not attempted, and indeed it seems scarcely possible, to form an useful arrangement, on a single principle. The analogous preparations in the different Pharmacopœias, are always placed immediately next each other, which renders it easy to compare them, and to discover at once the circumstances in which they resemble, or differ from, each other.

Concerning this third edition, it is only necessary to mention, that it contains the many corrections and improvements made by the Edinburgh College, when they republished their Pharmacopœia in 1805.

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THE EDINBURGH NEW DISPENSATORY.

PART I.

ELEMENTS OF PHARMACY.

1. THE object of Pharmacy is to provide thofe fubftances which may be employed for the prevention or cure of difeafes.

2. To obtain this object completely, an acquaintance with the phyfical and chemical properties of bodies is neceffary. This may be termed the Science of Pharmacy.

3. As few fubftances are found in nature in a ftate fit for their exhibition in medicine, they previoufly undergo various preparations. Thefe conftitute the Art of Pharmacy.

4. Pharmacy is fo intimately connected with Chemiftry, that the former can neither be underftood as a fcience, nor practifed with advantage as an art, without a conftant reference to the principles of the latter. For this reafon, it will be proper to premife fuch a view of the general doctrines of chemiftry, and of the moft remarkable properties of chemical agents, as is neceffary for the purpofes of pharmacy.

SECT. I.

EPITOME OF CHEMISTRY.

5. Matter is extended and divifible.

6. The moft minute particles into which bodies can ultimately be divided are called their *Elementary particles*.

7. The moft minute particles into which any fubftance can be divided, fimilar to each other, and to the fubftance of which they are parts, are termed its *Integrant particles*.

8. When the integrant particles admit of no further divifion, the body is a *Simple Subftance.*

9. But the integrant particles of moft bodies can be fubdivided into other particles, differing in their nature from each other, and from the body of which they are parts. Thefe bodies are called *Compound Bodies.*

10. If the particles, of which the integrant particles of any compound body are compofed,

a. admit of no further divifion, the body is a *Primary Compound*;

b. but if they be alfo compound, and admit of ftill further fubdivifion, they are called *Intermediate Particles*, and the body is a *Secondary Compound.*

11. Therefore the integrant particles

a. of fimple fubftances are alfo their elementary particles;

b. of primary compounds are compofed of elementary particles;

c. of fecondary compounds are compofed of intermediate particles.

12. The phenomena of matter are regulated by attraction and repulfion.

Attraction.

13. Attraction comprehends thofe forces which caufe bodies to approach towards each other.

14. It operates

a. at fenfible diftances, as in the attractions of gravity, electricity, and magnetifm;

b. at infenfible diftances;

a a. between particles of the fame fpecies, conftituting the attraction of cohefion or aggregation;

b b. between particles of different fpecies, the attraction of compofition or affinity.

Repulsion.

15. Repulfion tends to feparate bodies from each other.

16 It alfo operates either

a. at fenfible diftances, as in the repulfion of electricity and magnetifm; or,

b. at infenfible diftances, as in the repulfion of the matter of heat or caloric.

17. The phenomena refulting from the operation of the fecond clafs of attractions (14. *b.*), and fecond clafs of repulfions (15. *b.*), conftitute the proper objects of chemiftry.

Aggregation.

18. Bodies exist under different forms of aggregation:

a. Solid, in which the attraction of cohesion resists relative motion among the particles, either

a a. perfectly, as in hard bodies; or

b b. imperfectly, as in soft, malleable, ductile, and elastic bodies.

b. Fluid, in which it admits relative motion among the particles, either with facility, as in perfect fluids; or difficultly, as in viscid fluids.

c. Gaseous, in which the particles repel each other.

Affinity.

19. Affinity is regulated by the following laws:

a. It does not act at sensible distances.

b. It is exerted only between particles of different species.

c. It is exerted by different bodies, with different degrees of force.

d. The action produced by different affinities, existing in one substance, is called *Resulting Affinity*.

e. It is the inverse *ratio* of saturation.

f. It increases with the mass, that is, the absolute weight of any body multiplied by the degree of its affinity.

g. Its action is influenced by cohesion, elasticity, and temperature.

h. It is often accompanied by a change of temperature.

i. Substances, chemically combined, acquire new properties;

k. And cannot be separated by mechanical means.

20. Affinity is

a. simple, when two bodies unite, in consequence of their mutual attraction alone, whether these bodies be themselves simple or compound, and even although, in the latter case, it be attended with decomposition.

b. compound, when there is more than one new combination, and when the new arrangement would not have taken place, in consequence of the attractions tending to produce either combination singly.

c. disposing, when bodies, which apparently have no tendency to unite, combine, in consequence of the addition of another body, which has a strong affinity for the compound.

When the science of chemistry comes to be better understood, all the cases at present referred to this last species of affinity, will probably be found to belong to one of the preceding species: for, it is absurd to suppose, that a body can possess affinities before it is formed.

21. The attractions which tend to preſerve the original arrangement of bodies preſented to each other, are denominated Quieſcent attractions; thoſe which tend to deſtroy the original, and to form a new arrangement, are termed Divellent attractions.

22. It is evident, that no new arrangement can take place, unleſs the divellent be more powerful than the quieſcent attractions.

Claſſification of SIMPLE *or* ELEMENTARY SUBSTANCES.

23. Simple ſubſtances:

A. Without appretiable gravity,	Light.
	Caloric.
	Electricity.
	Magnetiſm.
B. Gravitating ſubſtances:	
a. Capable of ſupporting combuſtion,	Oxygen.
b. Oxygenizable,	Hydrogen.
1. Incombuſtible,	Nitrogen.
	Muriatic acid.
2. Combuſtible,	Carbon.
	Sulphur.
	Phoſphorus.
	Metals.
c. Having no affinity for oxygen,	Earths.
	Potaſs and ſoda.
	Fluoric and Boracic acids.

Although, from their not having been yet decompounded, the muriatic, fluoric, and boracic acids, are enumerated here, their properties are detailed under the head of acids; for there is every analogical reaſon for believing them to be compounds.

24. In treating of theſe ſubſtances, I ſhall begin with the firſt claſs, on account of the very great influence of caloric on all chemical actions: but, of the ſecond claſs, I ſhall firſt conſider the laſt order, becauſe they are tangible objects, conſiderably permanent in their properties, and ſimple in their action; and becauſe the reader will thus become gradually familiarized with chemical language, before entering upon the conſideration of ſubſtances, whoſe properties are ſcarcely the objects of our ſenſes, and which are highly alterable in their nature, and complicated in their action.

25. Compound bodies may be divided into

a. primary compounds (10. *a.*) conſiſting of ſimple ſubſtances, combined with each other. Theſe may be ſubdivided into

binary, ternary, quaternary, &c. according to the number of their constituents.

b. secondary compounds (10. *b.*) consisting of compound bodies combined with simple bodies, or with each other.

26. This division is entirely arbitrary, as we are in fact ignorant of what are really simple bodies, and cannot ascertain the manner of combination in bodies compounded of three or more elements. The division, however, is convenient.

27. As the chemical nature of bodies is determined by their action on each other, and as, in every case, we should endeavour to advance from what is known, to what is not known, the simple substances will first be described, and then such of the primary compounds which they form with substances already treated of as are not more conveniently arranged in separate classes.

Light.

28. Light emanates in every direction from visible bodies.

29. It moves in straight lines, with a velocity equal to 200,000 miles in a second.

30. Its gravity is not appretiable.

31. When a ray of light passes very near a solid body, it is *inflected* towards it.

32. When it passes at a distance somewhat greater, it is *deflected* from it.

33. When a ray of light falls upon a polished surface, it is *reflected* from it, and the angle of reflection is equal to the angle of incidence.

34. Bodies which do not allow light to pass through them are termed *Opaque*.

35. Bodies which allow it to pass freely through them are termed *Transparent*.

36. When a ray of light passes obliquely from one medium into another of greater density, it is bent towards the perpendicular; but if the second medium be of less density, it is bent from the perpendicular. The light, in both cases, is said to be *Refracted*.

37. The refracting power of bodies is proportional to their densities, except with regard to inflammable bodies, of which the refracting power is greater than in proportion to their densities.

38. By means of a triangular prism, light is separated by refraction into seven rays; red, orange, yellow, green, blue, indigo, and violet.

39. These rays are permanent, and suffer no further change by reflection or refraction.

40. They differ in flexibility and refrangibility; the red possessing these properties in a less degree than the orange, the orange than the yellow, and so on in the order of their enumeration.

41. They possess different powers of illumination. It is greatest between the yellow and green, and gradually declines towards both ends of the spectrum.

42. The different colours of bodies depend on their transmitting or reflecting those rays only which constitute their particular colours.

43. White consists of the whole prismatic rays united.

44. Black is the total absence of light, or complete suffocation of all the rays.

45. The sun's rays possess the power of heating bodies.

46. The heating power of the different rays is inversely as their refrangibility. But as this power is greatest at some distance beyond the red end of the visible spectrum, it is probable that it is totally independent of the colorific rays.

47. Bodies are heated by light inversely as their transparency, and directly, as the number of rays suffocated by them.

48. The sun's rays possess the chemical property of separating oxygen from many of its combinations.

49. The disoxygenizing power of the different rays is in proportion to their refrangibility. But as this power is greatest at a small distance beyond the violet end of the visible spectrum, it is probable that it is totally independent of the colorific or calorific rays.

50. Light is absorbed by many bodies, and again emitted by them in the dark.

51. The sources of light are the sun's rays, combustion, heat, and percussion.

52. Light is supposed by many to exist in a latent state in all combustible bodies.

Caloric.

53. Heat, in common language, is a term employed to express both a certain sensation, and the cause producing that sensation. In philosophical language, it is now confined to the sensation, and the term *Caloric* has been substituted to express the cause.

54. *Temperature* is that state of any body, by which it excites the sensation of heat or of cold, and produces the other effects which depend on the excess or deficiency of caloric.

55. The most general effect of caloric is expansion; the only real exception to this law being the contraction of water from the lowest temperature at which it can remain fluid, to 42.5° F. This expansion either consists,

a. in a simple increase of volume; or

b. it produces a change of form in the substance heated.

56. The former species takes place gradually, and at all tem-

peratures, as long as the bodies expanded undergo no other change.

57. Bodies differ very much in the degree of expansion which equal increments of temperature produce in them. Gases are more expansible than fluids, fluids than solids. The individuals of each form of aggregation also exhibit considerable differences.

58. The second species occurs suddenly, and always at certain degrees of temperature.

59. The degree at which any solid is rendered fluid by means of caloric, is denominated its point of fusion; and that at which either a solid or a fluid is converted into vapour, is its boiling point, or point of vaporization. Vaporization is much retarded by increase of pressure, and facilitated by its diminution, insomuch, that those substances which, under the ordinary pressure of the atmosphere, seem to pass at once from the state of solid to that of vapour, may, by the application of sufficient pressure, be made to assume the intermediate state of fluidity; while, on the contrary, all fluids which have been hitherto tried, begin in a vacuum to boil and omit vapour, when their temperature is lower by 120° at least than their vaporific point, at the ordinary pressure of the atmosphere.

60. From analogy, all bodies are considered as solid, when totally deprived of caloric; but they are termed solid, fluid, or gaseous (18.), according to the state in which they exist at the ordinary temperature of the atmosphere. They are also termed fusible, or infusible, volatile, or fixed, condensible, or permanently elastic, according to the effects of caloric upon them.

61. Another very general effect of caloric, is increase of temperature.

a. This effect is constant when bodies retain their form of aggregation, or undergo the gradual species of expansion (55. *a*.);

b. but while they undergo the sudden species (55. *b*.) they remain at one determinate temperature, that necessary for their fusion or vaporization, until the change be completed throughout the whole.

62. During the time necessary to effect this, the influx of caloric continues as before, and as it does not increase the temperature, it is said to become latent or combined.

63. The caloric necessary for these changes (61. *b*.) is best denominated the caloric of fluidity, and the caloric of vaporization; and its quantity, is determinate with regard to each substance.

64. The absolute caloric, or total quantity of caloric contained in any body, is perfectly unknown; but the quantity which increases the temperature of any body a certain number of degrees, is termined its Specific caloric; (Capacity for caloric, of Black, Crawford, and others), when its weight is the object of comparison; and by Dr Thomson, its Capacity for caloric, when its

volume is considered. The specific, and therefore the absolute, caloric of bodies, varies very much.

65. Incandescence is the least general effect of caloric, as it is confined to those substances which are capable of supporting the very high temperature necessary for its production, without being converted into vapour or gas.

66. On the living body caloric produces the sensation of heat, and its general action is stimulant. Vegetation and animal life are intimately connected with temperature, each climate supporting animals and vegetables peculiar to itself.

67. Caloric influences affinity, both on account of the operation of its own affinities, and of its facilitating the action of bodies, by counteracting cohesion (18). For the latter reason, it also promotes solution, and increases the power of solvents.

68. The particles of caloric repel each other: it is therefore disposed to fly off in every direction from a body in which it is accumulated, or to pass off by radiation.

69. Caloric is attracted by all other bodies.

70. It has therefore an irresistible tendency so to distribute itself as to produce an universal equilibrium of temperature, or to pass from bodies in which it is accumulated, into bodies in which it is deficient, until the attraction of each for caloric, and the repulsive force (67) of the caloric contained in each become equal to each other.

71. Caloric is radiated most slowly by polished metallic surfaces, and most quickly by rough blackened surfaces.

72. Radiated caloric is admitted most readily by rough blackened surfaces, and most difficultly by polished metallic surfaces.

73. Radiated caloric is transmitted with the velocity of light; and, like it, it is reflected and refracted.

74. But the passage of caloric through most bodies is immensely slower than radiated caloric.

75. When caloric moves through bodies with this diminished velocity, it is said to be conducted by them. Metals are the best conductors; then stones, glass, dried wood. Spongy bodies, in general, are bad conductors. Fluids also conduct caloric; but as they admit of intestine motion among their particles, they carry it more frequently than they conduct it.

76. If affinity for caloric has any influence on the conducting power of bodies, it must increase it, or their conducting power must be directly as their affinity for caloric.

77. The general effects of the abstraction of caloric, are diminution of volume, condensation, diminution of temperature, and sensation of cold. It also influences affinity, and, in general, retards solution. The abstraction of caloric never can be total; and the attempts to calculate the thermometrical point at which it would take place, although ingenious, are not satisfactory. Those most worthy of confidence place it about —1500° F.

(76.) The means employed to increase temperature are, the rays of the sun, collected by means of a concave mirror, or double convex lens, electricity, friction, percussion, collision, condensation, and combustion. Temperature is diminished by rarefaction, evaporation, and liquefaction.

(77.) Temperature is estimated relatively by our sensations, and absolutely by means of various instruments. The thermometer indicates temperature by the expansion which a certain bulk of fluid undergoes from the addition of caloric, and by the condensation produced by its abstraction. Mercury, from the uniformity of its expansion, forms the most accurate thermometer; but for temperatures in which mercury would freeze, alcohol must be employed. Air is sometimes used to shew very small variations of temperature. The pyrometer of Wedgwood, which is employed for measuring very high temperatures, depends upon the permanent and uniform contraction of pure clay at these temperatures.

Electricity.

78. The particles of the electric fluid repel each other, with a force decreasing as the distances increase.

79. They attract the particles of other bodies, with a force decreasing as the distances increase; and this attraction is mutual.

80. They are dispersed in the pores of other bodies, and move with various degrees of facility through different kinds of matter.

- *a.* Bodies, through which they move without any perceivable obstruction, are called Non-electrics.
- *b.* Bodies, through which they move with very great difficulty, are called Electrics.

81. The phenomena of electricity arise

- *a.* from the actual motion of the fluid from a body containing more into another body containing less of it:
- *b.* from its attraction or repulsion, independently of any transference of fluid.

82. By rubbing electrics on each other, the distribution of the electric fluid in them is altered. On separating them, the one contains more, and the other less, than the natural quantity; or, the one becomes positively, and the other negatively electrified.

83. Electrics may also be excited by rubbing them with non-electrics.

84. If a body B be brought into the neighbourhood of an electrified body A, B becomes electrified by position.

85. If a body B be insulated, that is, in contact with electrics only, when brought into the neighbourhood of an electrified body A, a spark passes between them, accompanied by noise.

B becomes permanently electrified, and the electricity of A is diminiſhed.

86. When a body A has imparted electricity to another body B, they repel each other, unleſs B ſhall have afterwards imparted all its electricity to other bodies.

87. Bodies repel each other, when both are poſitively or both negatively electrified.

88. Bodies attract each other, when the one is poſitively and the other negatively electrified.

89. If either of the bodies be in the natural ſtate, they will neither attract nor repel each other.

90. The ſpark (84.) is accompanied by intenſe increaſe of temperature (75.), and will kindle inflammable bodies.

91. It produces very remarkable chemical effects, depending chiefly on ſudden and momentary increaſe of temperature, and on the light produced.

92. Electricity acts on the living ſyſtem as a ſtimulus.

Galvanism.

93. The phenomena of galvaniſm ſeem to depend ſolely on the agency of electricity, excited during certain chemical actions.

94. It is excited by arranging at leaſt three heterogeneous bodies; for inſtance, two metals and a fluid, in ſuch a manner, that the two metals be in direct contact with each other, in one part, and have the fluid interpoſed between them in another.

95. The pile of Volta, by which it is rendered moſt manifeſt, is conſtructed, by combining a ſeries of ſimple galvanic arcs (93.) into one continuous circle, in one uniform order of arrangement.

96. The ſolids capable of exciting galvaniſm, are the metals and charcoal; and the moſt efficient fluids are certain ſaline ſolutions.

97. The effects of the ſimple galvanic circle (93.) on the animal body, are the production of a ſenſation of light when applied to the eye; of an acid taſte on the tongue; and the excitement of the muſcles through the medium of the nerves.

98. The pile, when well conſtructed, beſides theſe effects, alſo gives a ſhock and ſpark reſembling thoſe of electricity (84.), and proves, that the galvanic action is always accompanied by the decompoſition of the fluid, and a combination of one of its conſtituents with one of the metals.

Magnetism.

99. If an oblong piece of iron be ſuſpended freely, it will aſſume a determinate poſition with regard to the axis of the earth.

100. When the ſame end always points in the ſame direction, it is ſaid to poſſeſs polarity, or to be a magnet.

101. The ſimilar poles of two magnets repel each other; and the diſſimilar poles attract each other with a force decreaſing as the diſtances increaſe.

102. Any piece of iron, when in the neighbourhood of a magnet, is a magnet; and its polarity is ſo diſpoſed, that the magnet and iron mutually attract each other.

103. Magnetiſm does not ſeem to affect ſenſibility or irritability, or to influence chemical action.

Salifiable Bases.

104. The great bulk of this globe conſiſts of earths and ſtones. Although theſe vary infinitely in their external character and phyſical properties, they are found to conſiſt of a very few ſubſtances, mixed together in different proportions, and modified by external agents.

105. Theſe elementary ſubſtances are termed *Earths*. Their general characters are, total want of inflammability, infuſibility, fixedneſs, a ſpecific gravity leſs than 5, inalterability, whiteneſs, dryneſs, brittleneſs, ſparing ſolubility in water, and, in general, inſipidity and want of ſmell, capability of forming chemical compounds with acids, alkalies, ſulphur, phoſphorus, and oils, and fuſibility when mixed with each other, or with alkalies, into colourleſs glaſſes, enamels, or porcelains.

106. *Alkalies* are a claſs of bodies which are commonly defined to be incombuſtible, ſoluble in water, cauſtic, and capable of neutralizing the acids, of combining with alcohol, oils, earths, ſulphur, and phoſphorus, and of changing vegetable blues and reds to green: But as many of theſe properties are poſſeſſed in a greater or leſs degree by ſubſtances uſually claſſed with the earths, and as there is a continual gradation from the inſipidity, inſolubility, and infuſibility of ſilica, to the cauſticity, ſolubility, fuſibility, and comparative volatility of potaſs, they are ſometimes claſſed together under the general name of *Salifiable Baſes*.

Earths.

107. *Silica*, when obtained perfectly pure by art, is in the form of a very fine powder, hard, rough, and gritty, to the touch; when applied to the tongue, giving a rough and dry ſenſation, but without taſte or ſmell, having a ſpecific gravity of 2.66; when completely diſaggregated, ſoluble in 1000 times its weight of water; ſoluble in the fixed alkalies and fluoric acid; fuſible with the fixed alkalies and other earths; and combining by fuſion with the metallic oxides, and the phoſphoric and boracic

acids. It has a tendency to cryſtallization, and its ultimate particles ſeem to be tranſparent. It in general imparts to the foſſils of which it is a principal conſtituent, tranſparency, luſtre, a tendency to cryſtallization, and a degree of hardneſs, enabling them to ſtrike fire with ſteel. Rock-cryſtal, quartz, agate, flint, calcedonyjaſper, ſhorl, are example of ſiliceous ſtones.

108. *Zirconia* is obtained in the form of a fine white powder, almoſt ſoft to the touch; without taſte or ſmell; having, in a ſtate of aggregation, a ſpecific gravity of 4.3; inſoluble in water; infuſible by heat alone, but, when ſurrounded by charcoal, its particles become agglutinated, and ſo hard as to ſtrike fire with ſteel; ſoluble in all the acids; fuſible with ſilex and alumina; inſoluble in the alkalies, but ſoluble in their carbonates. It is only found in the zircon or jargon of Ceylon, and in different varieties of hyacinth.

109. *Alumina* is obtained in friable fragments, or in a very fine white powder; ſoft and unctuous to the touch; adhering ſtrongly to the tongue, abſorbing its moiſture, and producing a ſlightly ſtyptic effect upon it; ſpecific gravity 2; inſoluble in water, but very diffuſible through it; abſorbing a certain quantity of it rapidly, and forming with it a very ductile adheſive paſte, which contracts and hardens remarkably in the fire, but is perfectly infuſible. Its ultimate particles ſeem to be opaque. It combines with moſt of the acids, and theſe compounds have a ſweetiſh ſtyptic taſte; it unites with charcoal, the alkalies, baryta, ſtrontia, lime, and ſilica; it is manufactured into porcelain and glaſs. Foſſils, containing much alumina, have generally a laminated ſtructure; it exiſts cryſtallized in ſapphire; and it forms the baſis of all clays, boles, mica, trap, baſaltes, ſlate, and corundum.

110. *Yttria* (Gadolina) is obtained in the form of a fine white powder, without taſte or ſmell; inſoluble in water; it does not alter vegetable blues; is infuſible; inſoluble in the alkalies, but readily ſoluble in the carbonate of ammonia. With the acids it forms ſalts, which have a ſweet and ſomewhat auſtere taſte. It has been found only in the gadolinite.

111. *Glucina* is obtained in white light maſſes or powder, of a ſoft feel, inſipid, but adhering ſtrongly to the tongue; apyrous; and inſoluble in water, but forming with it a paſte, ſlightly ductile and adheſive; it is ſoluble in potaſs, ſoda, and carbonate of ammonia: it combines with moſt of the acide, forming ſoluble ſalts, difficultly cryſtallizable, of a ſweet and ſomewhat aſtringent taſte, and with ſulphuretted hydrogen. It has hitherto been found, very ſparingly, only in the beryl and emerald.

112. *Magneſia* is obtained in light white friable maſſes, or very fine powder; to the touch it is very fine; its taſte is not very ſenſible, but peculiar and pleaſant; its ſpecific gravity is 2.33. It is inſoluble in water, but forms with it a paſte with-

out ductility. It is apyrous; slightly alters vegetable blues to green; forms soluble componnds with most acids, and unites with sulphur. The fossils, in which it predominates, are generally soft, and have an unctuous feel; the principal are talc, steatites, asbestus, &c. *Officinal.*

113. *Lime* is obtained in the form of a grey stone, or in fragments more or less pulverulent and white; warm, acrid, and urinous to the taste; reddening the skin when applied to it for any time; specific gravity 2.33. It is soluble in 450 times its weight of water, and has a strong attraction for it. If a certain quantity of water be thrown upon fresh burnt lime, it is absorbed rapidly, with the extrication of considerable heat, and some phosphorescent light; at the same time the lime crumbles down into a very fine, white, dry powder, augmented much in bulk, but less caustic than before. Lime, thus slaked, does not renew these phenomena, on a further addition of water, but may be diffused or dissolved in it. It is apyrous; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus; it is very abundant in the mineral kingdom, and forms the bases of animal bones and shells. The calcareous spars, marble, limestone, chalk, and marl, consist chiefly of lime. *Officinal.*

114. *Strontia* is obtained in small, whitish grey, and often porous masses; its taste is warm, acrid, and urinous; it is slightly caustic, acting feebly on animal matters. Taken into the stomach, it is not poisonous; its specific gravity is nearly 4.; it is soluble in 200 times its weight of water at 50°, but in little more than six times its weight of boiling water, which, on cooling, deposites flat rhomboidal crystals; it is slaked more rapidly than lime, and it is infusible; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus, alumina, and silex. It is the basis of some of the heavy spars.

115. *Baryta* is obtained in small, grey, porous masses, of tolerable solidity; its taste is acrid, urinous, and pungent; applied to the skin, it proves caustic, and it is deleterious when swallowed; its specific gravity is 4; it is soluble in twenty times its weight of cold water, and in twice its weight of boiling water; depositing, on cooling, transparent, white, prismatic crystals; when slaked, it boils up with violence, becomes very hot, increases in bulk, and is changed into a spongy white mass. It changes vegetable blues to green; it is fusible; and combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus. It is the basis of some of the heavy spars.

Alkalies. (106.)

116. *Soda* is got in the form of solid plates, of a greyish-white

colour, urinous tafte, and burning caufticity; acting with confiderable violence on animal matter. When a certain quantity of water is thrown upon it, it abforbs and folidifies it, with the difengagement of caloric, and a lixivial fmell; a larger quantity diffolves it; it abforbs from the atmofphere moifture and carbonic acid, becoming lefs cauftic. In the fire it melts like an oily fubftance; boils, and is converted into vapour; but is incombuftible: it is cryftallizable into tranfparent prifmatic cryftals. It changes vegetable blues to green; unites with all the acids, oils, fulphur, fulphuretted hydrogen, phofphorus, many metallic oxides, and the earths. It forms the bafis of rock-falt, and fea-falt; is obtained from the afhes of marine plants, and exifts in fome minerals.

117. *Potafs* is a folid, white fubftance; extremely acrid to the tafte; unctuous to the feel, but highly cauftic; deftroying the fkin, and diffolving all foft animal fubftances. It is deliquefcent and foluble in half its weight of water at 50° Fahrenheit; it is fufible, and may be vaporized, but is perfectly incombuftible; it is capable of cryftallizing into very long quadrangular, compreffed prifms, terminated by fharp pyramids; it changes vegetable blues to green, and combines with all the acids, oils, fulphur, fulphuretted hydrogen, and the earths. It is obtained from the afhes of vegetables, and exifts in fome minerals. *Officinal.*

118. *Ammonia* is always claffed with the alkalies, from the analogy of its tafte, caufticity, combinations with the acids, and effects upon vegetable blues; but as it differs in many particulars, being extremely volatile, and a compound fubftance, readily decompofed, and formed in many chemical operations, and its compofition well known, I have ventured to feparate it from the alkalies, and refer it to that place, which, in all probability, it will always retain, and to which the other alkalies will, perhaps, be referred, when their compofition fhall be detected. *Officinal.*

PRIMARY COMPOUNDS OF THE SALIFIABLE BASES.

A. With each other; earthen-ware; glafs.
B. With fulphur; alkaline and earthy fulphurets.
C. With phofphorus; alkaline and earthy phofphurets.

119. The fubftances of this clafs exert a confiderable action on each other. Potafs was long believed to be the only folvent of filica; and it is now further proved, that the whole of this clafs are capable of combining, when prefented to each other in a ftate of folution; and on this property, in part, the effect of mortars depends. Their action on each other, by means of heat, is of much greater importance, as it includes the theories of the manufactures of porcelain and glafs.

120. Porcelain, and all kinds of earthen ware, consist of alumina and silica, mixed in different proportions into a plastic mass, fabricated into various shapes, dried and exposed to the heat of a furnace, where they undergo a kind of semifusion. They are glazed by being thinly covered with a more fusible composition, and may be afterwards painted with enamels, which are still more fusible than the glazing.

121. Glass is composed by melting about equal parts of potass or soda with silica. It is harder and more durable in proportion to the excess of the silica. The transparency of glass depends upon its being cooled quickly; for if cooled very slowly, it assumes a radiated crystalline appearance, and becomes perfectly opaque. By melting silica with about three times its weight of soda or potass, a glass is obtained, which not only is soluble in water, but even attracts moisture from the atmosphere. This solution has long been known by the name of Liquor of Flints. The property which metallic oxides have of rendering glasses more fusible, and of imparting to them certain colours, has given rise to the arts of imitating precious stones, and of enamelling.

Oxygen.

122. *Oxygen* is the principle on which most of the chemical qualities of atmospheric air depend. Its tendency to combination is so very strong, that it has never been procured in a separate. Oxygen gas, or the combination of oxygen with caloric, is its most simple form. This is permanently elastic, compressible, transparent, inodorous, and insipid. Its specific gravity is 0.00135. It supports inflammation; is necessary for respiration and vegetation, and is decomposed in all these processes; it constitutes 0.22 of atmospheric air. Oxygen is also a principal constituent in water, in all acids and metallic oxides, and in almost all animal and vegetable substances. It is separated from many of its combinations by the sun's rays, (48.)

Oxygenizement.

123. As the characteristic distinction between the simple substances already treated of, and those which remain to be examined, consists in the former possessing no affinity whatever for oxygen, and in the latter having a more or less strong attraction for it, it will be proper to explain in this place, the general phenomena which attend the combination of oxygen with oxygenizable bases. The term Combustion has been by the French chemists incorrectly extended to all these combinations; for, in common language, that word is applied to cases in which oxygen is not an agent, and always supposes the production of heat and

light, although in numberlefs inftances of oxygenizement thefe phenomena do not appear.

124. Oxygenizement is an example of chemical union, and is fubjected to all the laws of affinity, (19.). It requires the prefence and contact of oxygen, and of another fubftance poffeffing affinity for it.

125. Oxygenizable bafes attract oxygen with very different degrees of force. This attraction is much influenced by temperature. Thus charcoal, which at ordinary temperatures feems to poffefs no attraction for oxygen, unites with it rapidly, and almoft infeparably, when heated to ignition.

126. Oxygen combines with moft oxygenizable fubftances in certain definite proportions, perhaps only in one, and the apparent variety of proportions may be owing to a fecond or third fimilar combination of the firft compound with another quantity of oxygen, or of the bafe; and of the fecond compound with a third quantity.

127. The attraction between oxygen and the oxygenizable bafes, is in the inverfe ratio of faturation; or, in other words, the affinity by which they form their primary combinations, is ftronger than that by which they form any fecondary combination, and fo on progreffively.

128. In many inftances, oxygenizement is fo ftrongly oppofed by cohefion, that it does not take place unlefs affifted by a degree of heat fufficient to melt or vaporize the oxygenizable bafe.

129. It is alfo often accompanied by the extrication of caloric and light in a very confpicuous degree. To thefe the term combuftion fhould be confined; and only fuch oxygenizable bafes as are capable of exhibiting thefe phenomena are combuftible. Thefe phenomena depend upon the new compound, having a weaker affinity or lefs capacity than its conftituents for light and caloric, which are therefore extricated.

130. If the combuftible body be vaporized, flame is produced, and the procefs is then denominated Inflammation.

131. By its union with oxygenizable fubftances, oxygen undergoes very various changes of its properties. In many inftances, the compounds of oxygen are fluid or folid, opaque, coloured, incapable of fupporting inflammation, and deleterious to animal or vegetable life. The changes which the oxygenizable bafes undergo, are no lefs confpicuous. Their form, colour, tafte, odour, denfity, permeability to light and electricity, fpecific caloric, and, finally, their affinities, are often totally altered.

132. When, in confequence of oxygenizement, any fubftance acquires a four tafte, and the properties of converting vegetable blues to red, and of faturating or deftroying the characteriftic properties of alkalies and earths, it is faid to be acidified, and fuch compounds are termed *Acids*.

133. When it does not acquire these properties, the compounds are termed *Oxides.*

134. Many oxides are capable of being converted into acids, by combination with an additional quantity of oxygen.

135. Oxygen is capable of combining at the same time with two or more substances; and the oxides or acids which result from such combinations, are termed Oxides or Acids with a double or triple base.

136. In general, the bases which are least simple, unite with oxygen in the greatest variety of proportions.

PRIMARY COMPOUNDS OF OXYGEN.

A. Binary,
- *a.* with nitrogen:
  1. Atmospheric air.
  2. Nitrous oxide.
  3. Nitric oxide.
  4. Nitric acid.
- *b.* With hydrogen: water.
- *c.* With carbon:
  1. Incombustible coal, plumbago.
  2. Charcoal, (carbonous oxide).
  3. Gaseous oxide of carbon, (carbonic oxide).
  4. Carbonic acid.
- *d.* With sulphur:
  1. Protoxide of sulphur.
  2. Peroxide of sulphur.
  3. Sulphureous acid.
  4. Sulphuric acid.
- *e.* With phosphorus:
  1. Oxide of phosphorus.
  2. Phosphorous acid.
  3. Phosphoric acid.
- *f.* With metals:
  1. Metallic oxides.
  2. Metallic acids.

B. Ternary,
- *a.* with carbon and hydrogen:
  1. Oxides. Hydro-carbonous oxides, carburetted hydrogen gas, olefiant gas, alcohol, ether, oil, vegetable substances.
  2. Acids. Vegetable acids.
- *b.* with hydrogen and sulphur:
  Sulphuretted hydrogen, hydroguretted sulphur.

C. Quaternary, with hydrogen, carbon and nitrogen.
  1. Oxides. Animal substances.
  2. Acids. Animal acids.

Nitrogen, (Azote).

137. *Nitrogen*, or *azotic, gas* conftitutes 0.78 of the atmofphere. But as it has few attractions at ordinary temperatures, its principal effect on the chemical properties of the atmofphere feems to be the dilution of the oxygen gas, which in its pure ftate would be more active than is confiftent with the economy of nature. It alfo is permanently elaftic, compreffible, inodorous, and infipid; it greens very delicate vegetable blues; its fpecific gravity is 0.0012; it is unable to fupport refpiration, vegetation, or combuftion; it is acidifiable, and is a conftituent of the nitric and nitrous acids, nitrous and nitric oxides, of ammonia, and perhaps of the other alkalies, and of moft animal fubftances; it diffolves phofphorus and carbon in fmall quantities, and is not abforbed by water.

Primary Compounds of Nitrogen.

A. Binary,
- *a.* with oxygen:
  1. Atmofpheric air.
  2. Nitrous oxide.
  3. Nitric oxide. (Nitrous gas.)
  4. Nitric acid.
- *b.* With hydrogen. Ammonia. (Nitroguret of Hydrogen.)
- *c.* With fulphur. Sulphuretted nitrogen gas.
- *d.* With phofphorus. Phofphuretted nitrogen gas.

B. Quaternary, with hydrogen, carbon, and oxygen,
- *a.* Oxides. Animal fubftances.
- *b.* Acids. Animal acids.

138. *Atmofpheric air* confifts of 22 parts of oxygen gas, and of 78 of azotic gas by bulk, or 24.33, and 75.67 by weight; it is tranfparent, compreffible, and permanently elaftic; its fpecific gravity is 0.00123; it is inodorous and infipid, refpirable, and capable of fupporting inflammation. The atmofphere, befides the air now defcribed, alfo contains other gafes, vapour, &c.

139. *Nitrous oxide gas* is compofed of 37 of oxygen, and 63 of nitrogen. It does not change vegetable colours; its fpecific gravity is 0.00197; it fuffers no diminution when mixed with oxygen gas. Water abforbs about half its weight of it, at a mean temperature. It does not combine directly with alkalies; it fupports combuftion; and its refpiration, when perfectly pure,

or mixed with atmospheric air, produces the highest excitement the animal frame seems capable of undergoing.

140. *Nitric oxide gas* (nitrous gas) consists, according to Davy, of 44 nitrogen and 56 oxygen. It does not change vegetable colours. Its specific gravity is 0.001343. When mixed with about two-fifths of oxygen gas, they condense into red fumes, (nitrous acid), which are entirely absorbed by water. The quantity of oxygen gas that any air contains is sometimes estimated by the diminution of volume sustained after a sufficient quantity of nitrous gas has been mixed with it. Water absorbs 0.118 of its bulk of this gas. It is not inflammable; and only in very few instances supports combustion. It is noxious to vegetation, and its respiration is fatal to animals.

141. Nitrogen admits of higher degrees of oxygenizement, forming nitrous and nitric acids.

Hydrogen.

142. *Hydrogen gas* is often found collected in mines and caverns. It is permanently elastic and compressible. Its specific gravity is 0.000094, being the lightest body with which we are acquainted. It is highly inflammable, and burns in contact with oxygen gas or atmospheric air, and detonates on the application of a burning body when mixed with them. It extinguishes flame, and is deleterious to animal life. It dissolves sulphur, phosphorus, and carbon, forming with them peculiar fetid gases.

Primary Compounds of Hydrogen.

A. Binary,
- *a.* With oxygen; water.
- *b.* With nitrogen; ammonia.
- *c.* With sulphur; sulphuretted hydrogen.
- *d.* With phosphorus; phosphuretted hydrogen.

B. Ternary,
- *a.* With carbon and oxygen:
  1. Oxides; hydro carbonous oxides. Vegetable substances.
  2. Acids; Vegetable acids.
- *b.* With sulphur and oxygen; sulphuretted hydrogen.

C. Quaternary,
- With carbon, nitrogen, and oxygen:
  1. Animal oxides.
  2. ——— acids.

143. Hydrogen, combined with oxygen, in the proportion of 14.42, to 85.58, forms *water*. Water is tranſparent, colourleſs, inodorous, and inſipid. As water is aſſumed as the ſtandard, or unity, in all tables of ſpecific gravity, it is neceſſary to know that a cubic inch of it weighs, at 30 inches barometer, and 60° thermometer, 252.422 grains. At 32° it exiſts in a ſolid form, and is cryſtallized. At 212° it expands to 2000 times its bulk, and is converted into a very elaſtic vapour. It abſorbs ſmall quantities of the ſimple gaſes, eſpecially oxygen. It diſſolves ſeveral of the ſalifiable baſes, and in ſome degree all ſaline bodies, and is eſſential to their cryſtallization. It is compoſed and decompoſed in many inſtances, and its chemical agency is almoſt univerſal.

144. *Ammonia* (hydroguret of nitrogen) conſiſts of 80 parts of nitrogen, with 20 of hydrogen. It exiſts in its pureſt form combined with caloric as a gas, which is perfectly tranſparent and colourleſs, elaſtic and compreſſible; ſpecific gravity 0.000732; has a urinous and acrid odour, irritating the noſtrils and eyes, and an acrid and cauſtic taſte; does not diſſolve animal ſubſtances; is irreſpirable; extinguiſhes flame; colours vegetable blues green; and is decompoſed by being tranſmitted through a red hot tube, and by the electric ſpark, into its conſtituent gaſes; and by oxygen and atmoſpheric air at a red heat, and by oxy-muriatic acid, it is converted into water and nitrogen gas. It is abſorbed without change by porous bodies; it diſſolves ſulphur and phoſphorus; and combines readily with water in all its ſtates. Water is ſaturated by one-third of its weight of gaſeous ammonia, and is thereby increaſed in bulk, and acquires the ſpecific gravity of 0.905. Ammonia combines with all the acids, forming neutral ſalts. It is formed during the putrefactive fermentation; and is commonly claſſed with the alkalies. *Officinal.*

Carbon.

145. *Carbon*, in a ſtate of perfect purity, is well known by the name of diamond. It poſſeſſes the higheſt degree of luſtre, tranſparency, and hardneſs. It is cryſtallized, and generally colourleſs. Its ſpecific gravity is from 3.44 to 3.55. It is inſoluble in water, and can neither be melted nor vaporized by caloric. It is not acted upon by any chemical agent, except oxygen at very high temperatures. When expoſed in oxygen gas to the rays of the ſun, concentrated by a very powerful lens, its ſurface becomes ſenſibly blackened; it is ignited, and at laſt conſumed. The reſult of this combuſtion is carbonic acid gas; 100 parts of which conſiſt of 17.88 of carbon, and 82.12 of oxygen. It combines with iron, forming ſteel. It is a conſtituent of almoſt all animal and vegetable ſubſtances; and an oxide of carbon is obtained from them by expoſing them to heat in cloſed veſſels.

PRIMARY COMPOUNDS OF CARBON.

A. Binary,

a. With oxygen:

1. Incombustible coal; plumbago.
2. Charcoal (carbonous oxide).
3. Gaseous oxide of carbon (carbonic oxide gas).

(1–3: oxides.)

4. Carbonic acid.

b. With metals; Metallic carburets.

B. Ternary, with oxygen and hydrogen:

1. Oxides.

a. Hydro-carbonous.
b. Alcohol.
c. Ether.
d. Fixed oil and fats.
e. Wax.
f. Adipocere.
g. Volatile oils.
h. Resins.
i. Camphor.
k. Starch.
l. Sugar.
m. Jelly.
n. Tannin.

2. Acids.

a. Acetic.
b. Oxalic.
c. Tartaric.
d. Citric.
e. Malic.
f. Lactic.
g. Gallic.
h. Mucic.
i. Benzoic.
k. Succinic.
l. Camphoric.
m. Suberic.
n. Laccic.
o. Sebacic.

C. Quaternary, with nitrogen, hydrogen, and carbon.

1. Oxides.

a. Gum.
b. Tragacanth.
c. Extractive.
d. Gum-resin.
e. Bitter principle.
f. Narcotic principle.
g. Acrid principle.
h. Cinchonin.
i. Indigo.
k. Lignin.
l. Suber.
m. Caoutchouc.
n. Gelatin.
o. Albumen.
p. Fibrin.
q. Urea.

2. Acids.

a. Prussic.
b. Uric.
c. Amnic.

146. *Plumbago* and *incombustible coal* contain carbon in the first degree of oxygenizement. The most remarkable known

property of this oxide, is the very high temperature neceſſary for its combuſtion.

147. Common *charcoal* of wood (carbonous oxide) is carbon in the ſecond degree of oxygenizement, conſiſting of 63.86 of carbon, and 36.14 of oxygen. It is obtained in the form of ſolid maſſes of a black colour. It has neither ſmell nor taſte. It is brittle and never cryſtallized. It abſorbs light ſtrongly, is perfectly refractory in the fire, inſoluble in water, and a bad conductor of caloric, but an excellent one of electricity. At a red heat, it burns rapidly in oxygen gas, 28 of charcoal and 62 of oxygen forming 100 of carbonic acid gas. It alſo burns in atmoſpheric air, but leſs vividly. *Officinal.*

148. *Gaſeous oxide of carbon* (carbonic oxide gas) is carbon in its third degree of oxygenizement. It is inviſible and elaſtic; ſpecific gravity 0.001167. It does not ſupport combuſtion or reſpiration. With oxygen gas it burns with a lambent blue flame, and is converted entirely into carbonic acid, without producing any moiſture. It has no affinity for lime. It conſiſts of 25.99 carbon, and 74.11 oxygen; or 40.41 charcoal, and 59.59 oxygen.

SULPHUR.

149. *Sulphur* is a cryſtallizable ſolid; of a yellow colour; little ſenſible taſte; particular ſmell; ſpecific gravity 1.9907; brittle; electric; fuſible at 234°; burning with a pale blue flame at 302°; and with a bright white flame at 570°; and capable of combining with different proportions of oxygen. It is found pure in the neighbourhood of volcanoes, and exiſts in many minerals, and in animal ſubſtances. *Officinal.*

PRIMARY COMPOUNDS OF SULPHUR.

a. With oxygen:
1. Protoxide of ſulphur.
2. Peroxide of ſulphur.
3. Sulphureous acid.
4. Sulphuric acid.

b. With nitrogen. Sulphuretted nitrogen gas.
c. With hydrogen. Sulphuretted hydrogen.
d. With phoſphorus. Sulphuretted phoſphorus.
e. With ſalifiable baſes. Earthy and alkaline ſulphurets.
f. With metals. Metallic ſulphurets.

150. *Oxide of Sulphur* is of a dark violet colour, and an auſtere taſte, fracture fibrous, ſp. gr. 2.325; conſiſtence tough. It contains 2.4 *per cent.* of oxygen. It is formed on the ſurface of melted ſulphur.

151. *Peroxide of Sulphur* contains 6.2 *per cent.* of oxygen, and was procured by Dr Thomſon, by paſſing a current of oxymuriatic acid gas through flowers of ſulphur. It is in this ſtate that that he ſuppoſes ſulphur to exiſt in ſulphuretted hydrogen gas, and the hydro-ſulphurets.

152. *Sulphuretted Nitrogen Gas* is only known to have a fetid odour.

153. *Sulphuretted Hydrogen Gas* conſiſts of 71 ſulphur, and 29 hydrogen; ſpecific gravity 0.000135. It has the odour of rotten eggs; is not reſpirable; burns with oxygen gas without exploding, and ſulphur is depoſited; is readily abſorbed by water, and is the mode in which ſulphur exiſts in mineral waters; reddens vegetable blues; and in its affinities, and the cryſtallizability of its compounds, it reſembles the acids. *Officinal.* Hydro-ſulphuret of ammonia.

154. *Hydroguretted Sulphur* is ſulphuretted hydrogen combined with an additional doſe of ſulphur. It has the appearance of a yellow oil.

155. *Sulphurets* are ſolid opaque bodies, of conſiderable ſpecific gravity, decompoſible by heat, water, and the acids.

a. The alkaline and earthy ſulphurets have a red or browniſh red colour, and by ſolution in water are immediately converted into hydroguretted ſulphurets. Sulphuret of potaſs is officinal.

b. The metallic ſulphurets have neither taſte nor ſmell, are often poſſeſſed of metallic brilliancy, and are conductors of electricity. *Officinal.* The Sulphurets of antimony, of mercury, of iron.

Phosphorus.

156. *Phoſphorus* is a ſemi-tranſparent ſolid, ſlightly brilliant, and of a waxy conſiſtence; ſpecific gravity 1.770; taſte in ſome degree acrid and diſagreeable; ſmell alliaceous. It is brittle under 32°; its fracture is vitreous, brilliant, and ſometimes lamellated; above 32° it ſoftens a little, becomes ductile about 90°, melts at 99°, becoming tranſparent like a white oil; at 180° begins to be vaporized, and at 54° boils. It is cryſtallizable into priſmatic needles or long octohedrons. It exiſts in many minerals, and is obtained from bones and other animal ſubſtances.

Primary Compounds of Phosphorus.

a. With oxygen:

1. Oxide of phoſphorus.
2. Phoſphorous acid.
3. Phoſphoric acid.

b. With nitrogen. Phoſphuretted nitrogen gas.
c. With hydrogen. Phoſphuretted hydrogen gas.
d. With ſulphur. Phoſphuret of ſulphur.
e. With metals. Metallic phoſphurets.
f. With ſalifiable baſes. Alkaline and earthy phoſphurets.

157. In its ſolid ſtate, phoſphorus is not acted upon by pure oxygen gas, but when melted, burns in it at 80° with a dazzling ſplendour, abſorbing about half its weight of oxygen, and forming phoſphoric acid. In atmoſpheric air, it undergoes a ſlow combuſtion at 43°, emitting light in the dark, but without the production of ſenſible heat; abſorbing a portion of oxygen, and forming phoſphorous acid; at 148° it burns rapidly, but leſs brilliantly than in oxygen gas, forming phoſphoric acid. It is therefore always kept immerſed in boiled water; but even there its ſurface is oxidized, becoming white and opaque.

158. *Hydroguretted phoſphorus* poſſeſſes a peculiar odour, and the property of becoming luminous when mixed with oxygen gas. It may be combined with a much larger proportion of phoſphorus, acquiring then a fetid alliaceous odour, a conſiderable increaſe of ſpecific gravity, and the property of burning by the ſimple contact of oxygen, or of the atmoſphere, with a very brilliant white flame.

159. *Sulphuretted phoſphorus*, and phoſphuretted ſulphur, are of a yellowiſh colour, more fuſible than either of the components, and exceedingly inflammable.

160. Nitrogen gas diſſolves phoſphorus, forming a fetid gas, which inflames at a low temperature.

161. Phoſphuret of lime is inſoluble in water; but when thrown into it, decompoſes it, and produces phoſphuretted hydrogen gas, whoſe bubbles catch fire when they burſt on the ſurface of the water. Phoſphuret of baryta is a brown maſs; of a metallic appearance; very fuſible; luminous in the dark, decompoſed by expoſure to air, emmitting an alliaceous ſmell when moiſtened; and decompoſed by water, furniſhing phoſphuretted hydrogen gas. The phoſphuret of ſtrontia is very ſimilar.

Metals, and Metallic Oxides.

162. Metals are cryſtallizable; their form depends on the regular tetrahedron or tube; their ſurface is ſpecular; they are perfectly opaque, even when melted; their colour is various; their luſtre peculiar and ſhining, or ſplendent; their hardneſs various, but at leaſt conſiderable; many of them are brittle, others poſſeſs malleability and ductility in a ſurpriſing degree, and ſome are ſciſſile, flexile, or elaſtic; their fracture in general is hackly; their

texture compact, fibrous or foliated; many of them are remarkably sonorous; their specific gravity greater than 5; they possess no smell or taste, unless when heated or rubbed; they are the best conductors of caloric and electricity; are powerful agents in producing the galvanic phenomena, and a few of them are the only substances which exhibit the phenomena of magnetism. By the action of caloric they are melted, but with different degrees of facility, and some of them may be vaporized. Except iron and platinum, they melt suddenly, without undergoing any intermediate state of softness; and when melted, their surface is convex and globular. They are insoluble in water, but some of them decompose it, and are oxidized by it.

PRIMARY COMPOUNDS OF THE METALS.

a. With oxygen:
  1. Metallic oxides.
  2. Acids of arsenic, tungsten, molybdenum, chrome, and columbium.

b. With hydrogen. Hydrogurets.
c. With carbon. Carburets.
d. With phosphorus. Phosphurets.
e. With sulphur. Sulphurets.
f. With each other. Alloys and amalgams.

163. They are oxidized with different degrees of facility, some by mere exposure to air, and others seem almost to resist the action of heat and air. Their oxidizability is always increased by increase of temperature. Their oxides are in the form of powder, laminæ, or friable fragments; sometimes crystalline; of various colours, determinate with regard to each metal; possess greater absolute weight; are refractory, or fusible into glass; insipid, or acrid, and styptic; in general insoluble in water; and combine either with acids and alkalies, or only with acids. Some of those are disoxygenized by light alone, others by caloric, and others require hydrogen, carbon, &c.

164. Most of them are capable of combining with different proportions of oxygen. Dr Thomson proposes to call the oxides with a minimum of oxygen Protoxides, and with additional doses Deutoxides, Tritoxides, &c. in succession, and the oxides with a maximum of oxygen Peroxides.

165. Hydrogen gas is capable of holding arsenic, zinc, and iron, in solution.

166. Carbon unites only with iron.

167. The metallic phosphurets are fusible, brilliant, brittle, granulated, lamellated, scarcely combustible, and permanent.

168. The sulphurets are brittle; crystallizable in large brilliant and metallic laminæ, more easily fusible than the refractory metals, but less easily than the very fusible metals; decomposable by heat, humidity, and the acids.

169. The mixtures of the metals with each other are termed Alloys: those in which mercury is contained are Amalgams. They acquire by mixture new properties, and are in general more fusible than their components. The reguline metals are not soluble in the acids; but when acted upon by them, are first oxidized, and then dissolved. The metallic oxides, by fusion, colour glasses and enamels.

Oxidizable Metals.

170. *Gold* is of a brilliant yellow colour, insipid and inodorous; specific gravity between 19.258 and 19.300; soft and flexible; little elasticity or sonorousness; so ductile, that its surface may be extended more than 650,000 times; of very great tenacity; easily hammer-hardened; a good conductor of caloric, electricity, and galvanism; fusing at 32° of Wedgwood; brittle when cooled too quickly; crystallizing in octohedrons; unalterable in the air; converted, by a long and violent heat, into a vitrified, violet oxide; oxidized and dispersed by electricity; soluble in alkaline sulphurets; rendered brittle by phosphorus, arsenic, bismuth, tin, and antimony; less brittle by lead; soluble in mercury; hardened by zinc, copper, iron, steel, and silver; oxidizable, of a purple colour, and slightly soluble, in nitrous acid; very oxidizable, of a fawn or yellow colour by the nitro, or oxy-muriatic acids. Its oxide is easily reduced by light and heat; colours glasses purple or topaze-yellow, and forms a fulminating compound with ammonia.

171. *Platinum.* Of a grey, white colour, almost black when polished, insipid, inodorous; specific gravity 20.850 to 21.061; softer only than iron, and less ductile only than gold; most difficult of fusion, above 160° of Wedgwood; a good conductor of electricity and galvanism; unalterable by air and heat; converted into a grey powder, its first degree of oxidation, by electricity; unites with phosphorus; forms alloys with arsenic, bismuth, antimony, mercury, zinc, tin, lead, cast iron, copper, silver, and gold. It is oxidized and dissolved by the oxy-muritiac acid, and more readily by the nitro-muriatic. Oxide grey.

172. *Silver.* Very brilliant, white, insipid, inodorous; specific gravity 10.474 to 11.091; hardness between iron and gold; elasticity between gold and copper; strong acute sound; considerable ductility and tenacity; hardening much under the hammer; a good conductor of electricity, caloric, and galvanism; fusible at 28° Wedgwood; crystallizable by cooling; unalterable in the air; changed into a greenish oxide by long and violent heat, burn-

ing with a greenish flame, and instantly by the electric shock. Its phosphuret is granulated, brittle and fusible; its sulphuret grey, black, lamellated, or striated and fusible; it unites but slightly with the acidifiable metals and iron; is hardened by gold, bismuth, antimony, tin, lead, and copper, and amalgamates with mercury. It is oxidized, and dissolved by the sulphuric, sulphurous, nitric, and oxy-muriatic acids. Its oxide is greenish; reducible by light and heat, hydrogen, and the other metals; colours some glasses of an olive green, and is very soluble in ammonia. *Officinal.*

173. *Copper.* Bright red; disagreeable taste and smell when rubbed or heated; sp. gr. 7.79; ductile; of great tenacity; sonorous; fusible at 27° Wedgwood; granulated texture, and subject to blisters; a good conductor of caloric, electricity and galvanism; becomes brown, and at last green in the air; when heated, turns blue, yellow, violet, deep brown; when ignited and plunged into water, forms brown, brittle scales of oxide. Its phosphuret is brilliant, brittle, hard, and fusible; its sulphuret brown, fusible, and very phosphoric; its alloy with arsenic is white, with bismuth reddish, with antimony violet, with mercury deep red, with zinc forms brass, and with tin is orange; it is oxidized and dissolved by the sulphuric, nitric and muriatic acids; its oxide is brown, brittle, and soluble in ammonia, producing a beautiful blue. *Officinal.*

174. *Iron* is of a bluish-grey colour; texture either fine grained, fibrous or dense plates; sapid and odorous; specific gravity 7.600; the hardest, most elastic and most tenacious metal; very ductile; fusing at 158° Wedgwood, fusion at first clammy, afterwards very fluid; igniting by strong percussion, and inflaming by the collision of flint; magnetic. It is oxidized slowly in the air, especially when moist; when heated in contact with air, it is changed to a black oxide, containing 0.20 to 0.27 of oxygen; fusible, hard, brittle, lamellated, still attracted by the magnet; afterwards into brown, red, fine pulverulent oxide, not attracted by the magnet, containing 0.40 to 0.49 of oxygen. It burns with splendour and deflagration in oxygen gas, and is converted into a fused, black oxide; it decomposes water slowly, and when ignited, very rapidly. In some instances it is dissolved in hydrogen gas. Carbon united to iron, converts it into steel. *Officinal.*

175. *Steel* is of a grey colour, brilliant and granular in its fracture; specific gravity 7.795; harder than any of the metals, and more elastic, ductile, malleable, and fusible at a lower temperature than pure iron. Its characteristic property is, that after being heated, if suddenly plunged into cold water, it becomes harder, more elastic, less pliable and brittle; but by being again heated and cooled slowly, it acquires its former softness, pliability and ductility. Steel contains only some hundredth parts of car-

bon, and is known chemically, by letting a drop of acid fall upon it, which produces a grey or black ſpot.

176. *Plumbago* conſiſts of about 0.1 of iron, combined with carbon in its firſt degree of oxidizement. The phoſphuret of iron is white, granulated, brittle, permanent in the air. Its ſulphuret is yellow, hard, brittle, and very fuſible, oxidizing ſlowly in a humid atmoſphere. Iron forms alloys with arſenic, cobalt, mangáneſe, biſmuth, antimony, zinc, and tin. Iron is oxidized and diſſolved by almoſt all the acids; oxides, black, brown, red. It gi... glaſſes a brown, ſmoky, deep green, or black colour.

177. *Lead* is of a grey, blue, livid colour, ſtreak grey, diſagreeable taſte and odour; ſpecific gravity 11.352; ſoft; very laminable; hardens little under the hammer; very flexible; ſlightly tenacious; fuſible at 612° Fahrenheit; volatile at a red heat; tarniſhed in the air; ſlightly oxidized by air and water; by heat and air it forms a grey, then a yellow, and laſtly, a red oxide, which is vitriſiable. Its phoſphuret and ſulphuret are brittle; it forms alloys with arſenic, biſmuth, antimony, mercury, zinc, and tin; it is oxidized by, and combines with, the ſulphuric, nitric, muriatic, phoſphoric, and other acids. Its oxide imparts to glaſs a uniform denſity, and ſtrong refracting power. *Officinal.*

178. *Tin* is pure, brilliant, white, ſapid, and odorous; ſpecific gravity 7.291 to 7.500, ſoft, flexible, and emitting a crackling noiſe when bent: fuſing at 442° Fahrenheit; oxidizes ſlowly in the air; is converted, when fuſed, into a grey oxide; when red hot it burns vividly. Its ſulphuret and phoſphuret are lamellated and brittle; it forms alloys with arſenic, biſmuth, antimony, mercury, and zinc; it is oxidized by many acids, and combines with the muriatic, fluoric, boracic, and carbonic acids. Its oxide is grey or white, unites readily with ſulphur, and renders glaſſes opaque. *Officinal.*

179. *Zinc* is bluiſh-white, lamellated, ſapid, and odorous; ſpecific gravity 7.190; laminable, ſoft, clogging the file; fuſible at 700°; vaporizible; a powerful agent in the phenomena of galvaniſm; oxidized by fuſion; at a red heat it catches fire, and emits white films of oxide, which contain about 0.33 oxygen; it is ſoluble in hydrogen; it combines with phoſphorus, ſulphur, arſenic, antimony, and mercury; it eaſily decompoſes water: it is oxidized and diſſolved by almoſt all the acids. Oxide, white films. *Officinal.*

180. *Mercury.* Very bright white; ſpecific gravity 13.568; freezing at —39; boiling at 660°, partly ductile and malleable; oxidizable by trituration in the air, and in a farther degree by the action of the air and heat; does not decompoſe water; forms amalgams with many metals; and is oxidized and diſſolved by the ſulphuric, nitric, and oxy-muriatic acids. Oxides, black, yellow, red. *Officinal.*

181. *Tellurium.* White, lead-grey, very bright; harsh and brittle; lamellated; crystallizable; specific gravity 6.115; very fusible and volatile; burns with a blue and greenish flame, and a white smoke, having the odour of radish; oxide very fusible into a straw-coloured radiated glass: soluble in sulphuric, nitric, and nitro-muriatic acids; unites with sulphur. Oxides, black, white.

182. *Antimony.* White, very brilliant, lamellated; specific gravity 6.702; moderately hard; pulverizable; fusible at 809°; volatile when highly ignited; sensible taste and smell; unalterable in cold air; oxidizable by air and heat; oxide fusible into a yellow brown glass; decomposes water when ignited; oxidized by the sulphuric, nitric, and muriatic acids; combines with phosphorus and sulphur. Oxides, black, brown, orange, yellow, white; and colour glass yellow or hyacinthine. *Officinal.*

183. *Bismuth.* White, slightly yellow, in large specular plates; pulverizable; specific gravity 9.822; moderately hard; sensible odour and taste, fusible at 460°, and volatile at a high temperature; oxidizable by heat and air; oxide vitrifiable into a greenish yellow glass; oxidizable by boiling sulphuric, nitric, and muriatic acids; unites with sulphur. Oxides grey, yellow, dirty green, and colour glass of a greenish yellow.

184. *Manganese.* Small whitish grey globules; specific gravity 6.850; very hard and very brittle; very difficult of fusion; very oxidizable by exposure to air; decomposes water strongly; is oxidized by the sulphuric, nitric, muriatic acids; combines with many metals. Oxides white, red, brown, and black; colour glass brown, violet, or red; discolour glass coloured by iron.

185. *Nickel.* Yellow or reddish white, granulated; specific gravity nearly 9.; said to be malleable in a state of purity; magnetic; very difficult of fusion, and of oxidization in the air; oxidizible by most of the acids, which it colours of a brilliant green; combines with phosphorus, sulphur, and the metals. Oxide light clear green, colouring glass brown, orange, red.

186. *Cobalt.* Reddish-grey, fine grained, pulverizable; specific gravity between 7.700 and 7.800; very difficult of fusion; oxidizable before fusion; unalterable by water; attacked by all the acids; combines with phosphorus and sulphur; its alloys are granulated, rigid, and brittle. Oxide deep blue or black, and colours glasses of a fine blue.

187. *Uranium.* An incoherent mass of small agglutinated globules, of a deep grey and pale brown; specific gravity 6.440; very hard; very difficult of fusion, even by long continued heat; is attacked by several of the acids; combines with phosphorus. Oxide soluble in the alkalies, and very soluble in their carbonates. Oxide yellow, colouring glass of a greenish yellow, emerald green, or various brown.

188. *Titanium.* Agglutinated, hard, friable masses, crystallized,

internally of a brilliant red; infufible; unalterable by water; oxidizable by boiling fulphuric, nitric, and muriatic acids. Oxides, blue, deep red, white.

Acidifiable Metals.

189. *Chromum.* Agglutinated maffes of a whitifh grey colour; very hard, very brittle, and very infufible; appears to be difficult to oxidize and eafy to difoxidize; does not appear to decompofe water; not attacked by the fulphuric or muriatic acids; changed into a green oxide, and afterwards into a red acid, by the nitric acid diftilled from it. Oxide of a beautiful emerald green; acid a red or orange yellow powder.

190. *Molybdenum.* In black powder, or agglutinated, blackifh, friable maffes, having little metallic brilliance; fpecific gravity 6; by a ftrong heat changes into a white brilliant oxide in needles, and very acidifiable; oxidizable by boiling fulphuric acid, and acidifiable by the nitric acid. It forms a fulphuret; and its alloys are granulated and friable; acid white, pulverulent, ftyptic, fpecific gravity 8.400.

191. *Tungsten.* Small flightly adherent globules of a flate grey; fpecific gravity 17.5; very infufible; oxidizable in the air by heat, and afterwards acidifiable. Oxide yellow, pulverulent, colouring glafs of a blue or brown colour; and a white harfh powder; fpecific gravity 6.12.

192. *Arfenic.* Grey plates of a lively brightnefs; friable; fpecific gravity between 8.310 and 5.703; vaporizable at 540°; emitting a fmell like garlic; cryftallizable; oxidizable in the cold air; inflammable at a red heat, and fublimed in the form of the white oxide or acid; farther oxidizable by the nitric and nitrous acids; combines with phofphorus, fulphur, and many of the metals; foluble in hydrogen gas. *Officinal.*

193. *Columbium* has hitherto been examined only in the ftate of columbic acid, which is a white powder infoluble in water.

Befides thefe, feveral other metals have been lately difcovered, but their properties are too imperfectly underftood, and they are too rare to render a defcription of them neceffary in this place.

Acids with Simple Bases, and their Compounds.

194. The fimple fubftances, in their extreme ftates of oxygenizement, conftitute a ftrongly marked clafs of bodies termed *Acids*, which are diftinguifhed by the following properties:

a. Their tafte is four;
b. They change vegetable blues to red;
c. They combine with water in almoft any proportion, without fuffering any change in their properties, except what depend on dilution.

V. They unite with alkalies, earths, metallic oxides; forming compounds with them, poſſeſſed of new properties, and commonly known by the names of Neutral and Metallic Salts.

195. Beſides ſome of the metals, hydrogen is the only ſimple ſubſtance which does not ſeem to be capable of acidification; and, on the other hand, there are three acids, the muriatic, boracic, and fluoric, with whoſe compoſition we are ſtill unacquainted.

196. *Carbonic acid gas* is tranſparent, colourleſs, without ſmell, irreſpirable, and incapable of ſupporting inflammation; its ſpecific gravity is 0.0018. Water abſorbs an equal bulk of it at 41°, acquiring a ſpecific gravity of 1.0015, and an agreeable acidity and ſparkling appearance, eſpecially if heated to 88°. It is ſeparated from water by freezing or boiling. It is alſo abſorbed by alcohol, oil of turpentine, and olive oil. It contains 17.88 carbon, and 82.12 oxygen, or 28 charcoal, and 72 oxygen. Its compounds are denominated Carbonates. *Officinal.*

197. The *carbonates* always preſerve their alkaline properties in ſome ſlight degree. They are decompoſed by all the acids, forming a briſk effervescence, which is colourleſs. The carbonates of the metals very much reſemble their oxides. *Officinal.* Carbonates of baryta, of lime, of magneſia, of potaſs, of ſoda, of ammonia, of zinc, and of iron.

198. *Nitrous acid* is of a brown or red colour, exceedingly volatile and emitting an intolerable and ſuffocating odour. By the addition of water, its colour is ſucceſſively changed to blue, green, and yellow. In the ſtate of vapour, it is abſorbed by water, oil, and ſulphuric acid. It conſiſts of about 70 parts of oxygen, and 30 of nitrogen, or rather of nitric acid and nitric oxide. It forms Nitrites. *Officinal.*

199. The *nitrites* are characterized by their emitting the nitrous acid in orange fumes, on the addition of ſulphuric acid.

200. *Nitric acid* conſiſts of nitrogen combined with oxygen. It is liquid, colourleſs, and tranſparent. It is very corroſive, and tinges the ſkin of a yellow colour. It has a ſtrong affinity for water, and abſorbs it from the atmoſphere. When moſt concentrated, its ſpecific gravity is 1.504. It produces heat when mixed with water. It is decompoſed by many ſubſtances. Light converts it in part into nitrous acid. When entirely deprived of water, it ſets fire to oils, to ſulphuretted hydrogen gas, to iron filings, when perfectly dry; and to zinc, biſmuth, and tin, when poured on them in a ſtate of fuſion. It oxygenizes all the metals, except gold, platinum, and titanium. It conſiſts of 70.50 by weight, of oxygen, and 29.50 of nitrogen. *Officinal.*

201. The *nitrates*, by the action of fire, furniſh impure oxygen gas, mixed with nitrogen, and are reduced to their baſis. By the action of concentrated ſulphuric acid, they admit a white vapour,

and they are capable of ſupporting combuſtion. *Officinal.* Nitrates of potaſs, and of ſilver.

202. *Sulphurous acid gas* is colourleſs, incapable of maintaining combuſtion, and deleterious when reſpired. It has a ſtrong ſuffocating odour; its ſpecific gravity is 0.00246, or 0.00251. Water at 54° rapidly abſorbs one-fourth of its weight of this gas, and when ſaturated, acquires the ſpecific gravity of 1.040. It is again expelled from it by heat, but not by freezing. It is alſo abſorbed by ſulphuric acid, to which it imparts the property of cryſtallizing, forming what is called Glacial ſulphuric acid; oils and ether. When water is preſent, it is converted by oxygen gas into ſulphuric acid. It is decompoſed by hydrogen, carbon, and ſulphuretted hydrogen gas, when aſſiſted by heat. It oxidizes iron, zinc, and manganeſe. It conſiſts of 85 ſulphur, and 15 oxygen.

203. The *ſulphites*, by the action of heat, furniſh ſulphur, and become ſulphates. They are alſo converted into ſulphates, with efferveſcence, and exhalation of ſulphurous vapours, by the ſulphuric, nitric, muriatic, and other acids, and gradually, by expoſure to the atmoſphere when dry, and very quickly when diſſolved. *Officinal.* Sulphate of potaſs with ſulphur.

204. *Sulphuric acid* is alſo compoſed of ſulphur and oxygen. It may be obtained in a cryſtallized or glacial form, but generally exiſts as a denſe liquid; ſpecific gravity 1.85; ſlightly viſcid; tranſparent and colourleſs; without ſmell; of a ſtrong acid taſte. At 36° it freezes; it boils at 590°. It has a ſtrong attraction for water, abſorbing it rapidly from the atmoſphere, and producing conſiderable heat when mixed with it. It is decompoſed by moſt inflammable ſubſtances. It does not oxidize gold, platinum, tungſten, or titanium. It decompoſes the alkaline and earthy ſulphurets, and reduces all organic ſubſtances to charcoal. In medicine it is a powerful refrigerant and antiſeptic. It contains 56 ſulphur, and 44 oxygen. *Officinal.*

205. The *ſulphates* form ſulphurets, when heated to redneſs with charcoal, and furniſh copious precipitates with ſolutions of baryta. *Officinal.* Sulphates of baryta, potaſs, ſoda, zinc, copper, iron, mercury.

206. *Phoſphorous acid* is a white fluid of an oily appearance. It has a fetid odour, and diſagreeable taſte; and gives out a thick white ſmoke and vivid flame when ſtrongly heated. It is decompoſed by ignited charcoal. The proportions of phoſphorus and oxygen have not been aſcertained.

207. The *phoſphites* are fuſible, and when heated in cloſe veſſels furniſh a little phoſphorus, and become phoſphates. When heated in the open air, they emit a phoſphoreſcent light, and often flaſhes of flame, accompanied by a ſtrong ſmell of garlic, and a thick white vapour, and are converted into phoſphates.

208. *Phoſphoric acid* is compoſed of phoſphorous acid and oxy-

gen. It is cryſtallizable, fuſible, and vitreſcent. Its ſpecific gravity is 2.687. It readily attracts moiſture from the atmoſphere, and then its ſpecific gravity becomes 1.417. Its mixture with water produces little increaſe of temperature. It is decompoſed at a high temperature by hydrogen and carbon, and by ſeveral of the metals. It conſiſts of 40 phoſphorus and 60 oxygen.

209. The *phoſphates* are cryſtallizable, fixed, fuſible, vitrifiable, and phoſphoreſcent. They are not decompoſed by charcoal. They are ſoluble in nitric acid without effervеſcence, and precipitable from that ſolution by lime water. *Officinal.* Phoſphate of ſoda.

METALLIC ACIDS AND THEIR COMPOUNDS.

210. *Arſenious acid* is of a white colour; has a ſharp acrid taſte, and an alliaceous ſmell; ſpecific gravity 3.706; is ſoluble in 80 times its weight of water at 60°, and in 15 at 212°. At 283° it ſublimes; if heated in cloſe veſſels is vitrified, and its ſpecific gravity becomes 5.000. It conſiſts of 75 of arſenic, and 25 of oxygen, and is a moſt virulent poiſon. *Officinal.*

211. The *arſenites* are ſcarcely known; but their acid is driven off by heat, and is precipitated by all the acids.

212. *Arſenic acid* conſiſts of arſenious acid and oxygen. It is not cryſtallizable; has an acid cauſtic taſte, and is not volatile, but very fixed and vitrifiable. Its ſpecific gravity is 3.391. It attracts moiſture from the atmoſphere, and is ſoluble in two-thirds of its weight of water. By a red heat it loſes part of its oxygen, and becomes arſenious acid. It conſiſts of 8 parts of arſenious acid, and 1 of oxygen, or of 65 arſenic, and 35 oxygen.

213. The *arſenites* are decompoſed by charcoal at a high temperature.

214. *Tungſtic acid* is a white powder of a rough, metallic, and feebly acid taſte. Its ſpecific gravity is 3.600. It is ſoluble at 212° in twenty waters. Expoſed to heat it becomes yellow, brown, and laſtly black; emits no ſmoke, and is not fuſed; but loſes its ſolubility in water. The ſulphuric acid changes its colour to blue, and the nitric and muriatic acids to a fine yellow.

215. The *tungſtates* are little known.

216. *Molybdic acid* is a white powder of an acid but metallic taſte. Its specific gravity is 3.4. It is not altered in the air. It is melted, and is fixed, in a covered crucible; but when the cover is removed, it ſublimes in a white ſmoke, which condenſes in brilliant yellow ſcales. It diſſolves at 212° in 960 waters. By heat it forms a blue ſolution in ſulphuric acid. It is alſo ſoluble in the muriatic, but not in the nitric acid.

217. The *molybdates* are ſcarcely known.

218. *Chromic acid* is a red or yellow orange powder, of a par-

ticular, rough, metallic tafte. It is foluble in water, and may be obtained in ruby-coloured cryftals. It is decompofable by heat and light, paffing to the ftate of green oxide. It is reduced by heat and charcoal. It oxygenizes the muriatic acid.

219. The *chromates* are of a yellow or orange colour.

220. *Columbic acid* is a white powder, which reddens litmus paper, although it feems infoluble in water. It is foluble in boiling fulphuric and muriatic acids, but not in the nitric. It is precipitated from its folutions by water, potafs, and foda. With pruffiate of potafs it forms an olive green precipitate, and with tincture of galls, a deep orange precipitate. It combines with potafs and foda, and expels carbonic acid. It does not unite with ammonia.

221. *Columbate* of potafs refembles boracic acid in its appearance.

222. Other metallic oxides feem capable of acidification; but our information refpecting them is not yet fufficient to enable us to enumerate their properties.

Undecomposed Acids and their Compounds.

223. *Muriatic acid gas* is tranfparent and colourlefs. It deftroys life and extinguifhes flame. Its fpecific gravity is 0.002315. Water is capable of diffolving about an equal weight of it. Its fpecific gravity is then 1.500; it is generally of a pale yellow colour; is very volatile, and emits white fumes of a peculiar unpleafant odour. The gas decompofes alcohol and oil, and deftroys putrid exhalations. It is further oxygenized by the nitric acid. *Officinal.* Muriatic acid.

224. The *muriates* have a more or lefs pure falt tafte. They are not acted upon by any combuftible body. They are all foluble in water, and are the moft volatile and moft difficultly decompofed by heat of the neutral falts. They emit white fumes with the fulphuric acid, and oxy-muriatic acid gas with the nitric. *Officinal.* Muriates of foda, ammonia, baryta, lime, mercury, antimony.

225. *Oxygenized muriatic acid* (or, by contraction, oxy-muriatic acid) *gas* is compofed of muriatic acid 84 and oxygen 16. It is of a yellow colour, very pungent fmell, and acrid tafte. It fupports flame, but is deleterious when refpired. It deftroys the vegetable colours. It oxygenizes all oxygenizable fubftances, and repaffes to the ftate of muriatic acid. It is decompofed by light. It does not unite readily with water. Water when faturated with it weighs 1.003.

226. The *oxy-muriates* have lately had their exiftence rendered doubtful by Mr Chenevix.

227. *Hyper-oxygenized muriatic acid* consists of muriatic acid 35, and oxygen 65. It has not been obtained in a separate state.

228. *Hyper-oxy-muriates* give out very pure oxygen gas by the action of caloric, and become muriates. Their acid is expelled from them with noise, by the stronger acids; and they inflame combustible bodies, even spontaneously, and with detonation.

229. *Fluoric acid gas* is invisible, irrespirable, and extinguishes flame. It has a pungent smell, approaching to that of muriatic acid. It is heavier than common air. It corrodes the skin. It is absorbed by water. Its most remarkable property is that of dissolving silica. Its composition is unknown.

230. *Fluates* afford, when treated with concentrated sulphuric acid, a vapour which corrodes glass, and from which the silica is afterwards precipitated by water.

231. *Boracic acid* exists in the form of small, shining, laminated crystals. Specific gravity is 1.479. It is fixed and vitrifiable in the fire. It is soluble in fifty parts of boiling water. It is also soluble in alcohol, to which it imparts the property of burning with a yellow flame. It oxidizes only iron and zinc.

232. *Borates* are vitrifiable; and their concentrated solutions afford, when heated with the strong sulphuric acid, brilliant, lamellated crystals. *Officinal.* Sub-borate of soda.

Of Compound Oxides and Acids.

233. We have already noticed all the binary combinations which oxygenizable substances form with oxygen. These in general have considerable permanence in their characters, and admit of few variations in the proportions of their constituent principles. But oxygen is capable of entering into combination at the same time with more than one of these simple oxygenizable substances, forming oxides and acids, with double or triple bases, which, in consequence of the increased number of principles, are subject to greater variations in the proportion of these, and are less permanent in their characters. These are, however, the substances in which pharmacy is chiefly engaged, as they comprehend the whole of the vegetable and animal kingdoms. Chemists, borrowing their arrangement from natural history, have almost always considered them under the title of Vegetable and of Animal Substances. But such an arrangement is so totally unconnected with the principles of chemistry, that the imperfect state of our knowledge is the only apology that can be offered for its continuance; and imperfect as that knowledge is, we are persuaded, that even a very imperfect attempt, at a chemical classification of these bodies, is to be preferred.

Compound Oxides.

234. The compound oxides are characterized by their great alterability, and by their affording, when burnt with a sufficient quantity of oxygen, both water and carbonic acid. They may be divided into

a. Ternary oxides, containing various proportions of carbon, hydrogen, and oxygen.
b. Quaternary oxides, consisting of nitrogen, carbon, hydrogen, and oxygen.

235. The ternary oxides coincide nearly with the class of vegetable substances, and are characterized

a. By their being converted entirely into water and carbonic acid gas, when completely decomposed by oxygen.
b. By their undergoing the acid fermentation, from the action of air and water.
c. And by their furnishing nitrous gas and carbonic acid, when treated with nitric acid.

236. The quaternary oxides coincide nearly with animal substances, and are characterized

a. By their furnishing, when decomposed by oxygen, ammonia as well as water and carbonic acid gas.
b. By their becoming putrid from the action of air and water.
c. And by their furnishing nitrogen gas when treated with nitric acid.

Ternary Oxides.

237. The ternary oxides may be subdivided into gaseous, fluid, or easily fusible, and solid infusible. In general the gaseous and volatile compound oxides, contain the largest proportion of hydrogen, and the infusible dense oxides the largest proportion of carbon.

238. *Hydro-carbonous oxides* (hydro-carbonates) are invisible elastic gases of a strong disagreeable smell, irrespirable and incapable of supporting combustion, insoluble in water, burning with oxygen with a blue lambent flame, and producing carbonic acid gas and water. From their furnishing charcoal, when decomposed by melted sulphur, and from the products of their combustion, they evidently contain oxygen. There are different species of hydro-carbonates depending on the proportion of their constituents, which, from their specific gravities, are commonly distinguished into heavy and light hydro-carbonates.

239. The light hydro-carbonous oxides are obtained by the distillation of wet charcoal, or by transmitting the vapours of alcohol through an ignited tube: specific gravity 0.00059 to 0.00064. The heavy hydro-carbonous oxides are obtained, by distillation from camphor, ether, animal and vegetable substances, and by collecting the gas of marshes: specific gravity 0.00080 to 0.00082. The latter contain more carbon, require more oxygen for their decomposition, and furnish a larger proportion of carbonic acid gas, and less water than the former.

240. *Alcohol* is a transparent colourless liquid, of an agreeable penetrating smell, and pungent burning taste: specific gravity 0.8. It remains fluid in the greatest natural or artificial cold. It boils at 176°, and in vacuum at 56°. Alcohol unites with water in every proportion. During the combination, caloric is evolved, and the specific gravity of the compound is greater than the mean of those of the components. Alcohol dissoves about 60 of sulphur, when they are presented to each other in a state of vapour. It also dissolves a little phosphorus. These solutions are decomposed by water. It dissolves the boracic and carbonic acids, ammonia, soda, and potass, and is the means employed to obtain the two last in a state of purity. Its action on the salts is various. It dissolves the volatile oils, resins, soaps, balsams, camphor, sugar, tannin, cinchonin, extractive, and in part the gummy resins. Alcohol is very inflammable, and when kindled it burns entirely away with a blue flame without smoke. The products of its combustion are carbonic acid and water. Is is also decomposed by being transmitted in the state of vapour through a red-hot porcelain tube; by being heated with the fixed alkalies; and by the action of the sulphuric, nitric, oxy-muriatic, and acetic acids. From Lavoisier's experiment on the combustion of alcohol, it was found by calculation to consist of 51.72 oxygen, 29.88 charcoal, and 18.40 hydrogen; but by correcting the calculation according to Morveau's experiments, proving the composition of charcoal, from the same experiment alcohol would seem to consist of 65.05 oxygen, 18.22 carbon, and 16.73 hydrogen. *Officinal.*

241. *Ether* is a transparent colourless fluid, of a very fragant odour, and hot pungent taste: specific gravity 0.758. It freezes and crystallizes at—46°. It boils at 98°, and in vacuum at—20°. It is very soluble in air, and during its evaporation it produces an intense degree of cold. It is soluble in ten parts of water, and in alcohol in every proportion. It dissolves a small portion of phosphorus, and the solution is decomposed by alcohol. It absorbs nitrous gas, combines with ammonia, and dissolves the volatile oils, resins, and caoutchouc. Ether is extremely inflammable, and burns with a white flame. Its vapour explodes when kindled in contact with oxygen gas. It is decomposed by sulphuric acid, oxy-muriatic acid gas, and by being transmitted through a red-

hot porcelain tube. Its conſtituents are oxygen, carbon, and hydrogen, the proportions not aſcertained. *Officinal.*

242. *Fixed oils* are tranſparent, more or leſs coloured, ſomewhat viſcid, inodorous fluids, having a mild taſte and unctuous feel. In the different ſpecies the ſpecific gravity varies from 0.9403 to 0.9153. The point of congelation alſo differs conſiderably, but in general it is within the range of the ordinary temperatures of the atmoſphere. Their boiling point exceeds 600°, and by being converted into vapour, they become empyreumatic. Fixed oils do not ſeem capable of combining with charcoal, but are freed from impurities by being filtered through hot charcoal. When aſſiſted by heat, they diſſolve ſulphur and phoſphorus. They may be blended with ſugar and gum by trituration as in emulſions, and they diſſolve the volatile oils, and reſins, and gummy reſins. With the alkalies and earths they form ſoaps, and with metallic oxides plaſters. They are not ſoluble in water or in alcohol. They unite readily with oxygen, which renders them concreſcible. Thoſe oils which dry without loſing their tranſparency, as linſeed oil, are termed drying oils, in contradiſtinction to the fat oils which from expoſure become white, opaque, and thick, and remain greaſy, ſuch as oil of olives or of almonds. When they become rancid, they undergo a farther degree of decompoſition, and are found to contain ſebacic acid. Oil in the ſtate of vapour is inflammable, and burns with a white flame. When the combuſtion is complete, the products are carbonic acid gas and water, but in general ſoot is depoſited. The ſulphuric acid renders the fixed oils brown and thick, and converts them into water and charcoal. The nitric acid oxygenizes them. The oxygenized muriatic acid blanches them, and renders them concrete like tallow or wax. The oils oxidize ſeveral of the metals, and are oxidized by ſeveral of their oxides. From Lavoiſier's experiment on the combuſtion of olive oil, its conſtituent principles were eſtimated at 79 charcoal and 21 hydrogen; but by correction they appear to be 50.39 carbon, 20.23 hydrogen, and 29.38 oxygen. *Officinal.* Oil of almonds, linſeed, olives, muſtard, caſtor oil, and cocoa butter.

243. *Fat* and *tallow* ſcarcely differ from the fixed oils, except in being more concrete and more diſpoſed to rancidity. Fat melts between 92° and 127°. Tallow is ſtill leſs fuſible. They cannot be converted into vapour without ſuffering decompoſition, and, when melted, leave, like oil, a greaſy ſtain on paper. *Officinal.* Mutton ſuet, axunge.

244. *Wax* is a ſolid, of conſiderable conſiſtence, granulated and cryſtalline in its fracture, of a white colour, and without any remarkable odour or taſte. It ſoftens and becomes plaſtic when very ſlightly heated; at 142° it melts; at a higher temperature it is in part vaporized and decompoſed, and its vapour is inflam-

mable. It resists in a remarkable degree the action of the acids; but in most of its other properties it resembles the fixed oils. From its combustion it appears to consist of carbon 53.12, hydrogen 16.91, and oxygen 29.97; or, according to the former calculation, of 82.28 charcoal, and 17.72 hydrogen. *Officinal.*

245. *Spermaceti* may be obtained crystallized in white argentine plates, of an unctuous feel and taste, and a vapid smell. It melts between 90° and 95°, and at a higher temperature may be sublimed almost unchanged. Its vapour is inflammable, and its flame is bright, clear, and without smell. By exposure to air it becomes rancid. It is soluble, especially by the assistance of heat, in alcohol and in ether. In its other properties it agrees with the fixed oils, with which it unites very readily by fusion. Muscular flesh by long maceration in water is converted into a substance very analogous to spermaceti, but more fusible, melting at 82°; and biliary calculi often consist of another, which is much less fusible, requiring a heat of 192° for its fusion. For all these varieties, Fourcroy has proposed the generic name *Adipocere*. *Officinal.* Spermaceti.

246. *Soaps* are combinations of the fluid or concrete fixed oils with alkalies, earths, or metallic oxides. The alkaline soaps have an unpleasant taste and peculiar smell, form a milky solution with water, and a transparent one with alcohol, and are powerfully detergent. White soap is made of soda and olive oil or tallow. Brown soap contains also resin. Soft soap consists of potass and whale oil: The white spots in it are from the addition of a little tallow. The volatile liniment of the pharmacopœias is a soap of ammonia and olive oil. The alkaline soaps are decomposed by all the earthy salts. The alkali of the soap combines with the acid of the salts, and an earthy soap is formed from the union of the earth and oil. The earthy soaps are insoluble in water. The alkaline soaps are decomposed in the same way by the metallic salts. The metallic soaps are also insoluble in water: many of them are soluble in oil, and some of them in alcohol. *Officinal.* Soaps of soda and ammonia.

247. *Plasters* are also combinations of oil with metallic oxides. They are prepared by their immediate action on each other. Olive oil and litharge are most commonly employed. *Officinal.* Litharge plaster.

248. *Volatile oils* differ from the fixed oils most remarkably in being vaporized unchanged by a heat under 212°; by evaporating completely without leaving a stain on paper; by being sapid, often pungent and odorous; and by being soluble in alcohol, and to a certain degree in water. They are more inflammable than the fixed oils, and burn with a large white flame, emit a great deal of smoke, and require more oxygen for their combustion. By exposure to air they become coloured and thick, and are at

laſt converted into an almoſt inodorous reſin. They are alſo oxidized and converted into reſins by muriate of mercury, and muriate of antimony; the acids act on them with great violence, and are even capable of inflaming them. On the other hand, they reſiſt conſiderably the action of the alkalies. In their other general properties they agree with the fixed oils, from which they ſeem to differ in compoſition, only in containing a larger proportion of hydrogen. In other reſpects, theſe oils are infinitely varied, eſpecially in their taſte and odour. Some are as limpid as water, others are viſcid, others congeal on a ſlight diminution of temperature, and are even naturally conrete, and others are capable of forming cryſtallizations. Their predominant colours are the different ſhades of yellow and red, but there are alſo blue, green, and glaucous eſſential oils. Their ſpecific gravity varies from 0.8697 to 1.0439. *Officinal.* Oil of aniſe, cajeput, caraway, fennel, juniper, lavender, mace, origanum, pennyroyal, peppermint, pimento, roſemary, rue, ſaſſafras, ſavin, ſpearmint, turpentine, cloves, and all aromatic or odorous ſubſtances. *Empyreumatic oils,* oil of amber, of hartſhorn, of petroleum.

249. *Reſins* are concrete ſubſtances, poſſeſſing a certain degree of tranſparency, and are generally of an amber or browniſh-red colour. Their texture is homogeneous, and their fracture vitreous. They are eaſily reduced to powder, which readily agglutinates. Their ſpecific gravity varies from 1.0452 to 1.2289. They have little taſte or ſmell. They are electrics. Expoſed to a certain degree of heat, they melt without ſuffering alteration, but they are decompoſed when converted into vapour. Their vapour is inflammable, and burns with a large ſtrong flame and a great deal of ſoot. Reſins unite by fuſion with ſulphur, difficultly with phoſphorus. They are ſoluble in alcohol, the fixed and the volatile oils, and alkalies, and in nitric acid with evolution of nitric oxide gas. They are inſoluble in water, and are not acted upon by metallic oxides. *Officinal.* Pine reſins, dragons blood, guaiac, balſams of Peru, Tolu, Gilead, and Canada, turpentine, benzoin, ſtorax, olibanum, tacamahac, maſtiche, ſandarac, elemi.

Amber, copal, and about one-fifth of ſandarac, differ from the reſins in not being ſoluble in alcohol without particular management.

250. *Camphor* is a concrete friable ſubſtance, of a white colour, with a conſiderable degree of tranſparency, and a cryſtalline appearance, ſpecific gravity 0.9887. Its taſte is bitter and acrid, and its ſmell penetrating and peculiar. It is evaporated unchanged by a heat of 145°, but may be melted by ſuddenly expoſing it to 302°. The vapour when condenſed cryſtallizes in hexagonal plates. Its vapour is exceedingly inflammable, and when kindled it burns with a very white flame and a great deal of ſmoke, and leaves no reſiduum. The products of its combuſtion are carbonic acid gas, charcoal, and water. Camphor is ſoluble

in alcohol and in the acids. From these solutions it is precipitated by water. It is also soluble in hot oils, both volatile and fixed, but on cooling separates from them in plumose crystals. It is insoluble in water, and is not acted on by the alkalies, metals or metallic oxides. By repeated distillation with nitric acid, it is converted into a peculiar acid. It exists in many vegetables, but is chiefly procured from the laurus camphora. *Officinal.*

251. *Starch* is a fine white powder, generally concreted in friable hexagonal columns, smooth to the feel, and emitting a particular sound when compressed. It has neither taste nor smell. It is decomposed by heat. It is not soluble in cold water nor in alcohol. Warm-water converts it into a kind of paste, which on cooling assumes a gelatinous form. This jelly when dried by heat becomes transparent and brittle like gum, but is not soluble in cold water. Starch, after being thus dissolved in hot water, cannot be reduced to its original state. It is precipitated by infusion of galls, and the precipitate is soluble in boiling water, but not in alcohol. *Officinal.* Wheat, starch, flour, barley, oats.

252. *Sugar* is a hard, but brittle substance, of a white colour, disposed to form semi-transparent crystallizations, of a sweet taste, and without smell. When heated sufficiently it melts, is decomposed, emits a peculiar smell (caromel), and becomes inflamed. Sugar at 40° is soluble in its own weight of water, and in still less at 212°. It is also soluble in about four parts of boiling alcohol. It combines with volatile oils, and renders them miscible with water. It also unites with potass and lime. It is decomposed by the concentrated sulphuric and nitric acids. According to Lavoisier's experiments, it consists of 71.76 oxygen, 17.89 carbon, and 10.35 hydrogen; or, according to the original calculation, of 64 oxygen, 28 charcoal, and 8 hydrogen. *Officinal.* Sugar, honey, manna. Substances containing sugar, liquorice, sarcocoll, logwood, figs, raisins, currants, cassia fistula, prunes.

253. *Jelly* is contained in the juices of acid fruits. It is deposited from them in the form of a soft tremulous mass, almost colourless, and agreeable to the taste. It is scarcely soluble in cold water, but very soluble in hot water; and when the solution cools, it again assumes a gelatinous form. With sugar its combination is well known. By long boiling it loses this property of congealing. When dried, it becomes transparent, hard, and brittle, resembling gum. It combines with the alkalies, and is converted by the nitric acid into oxalic acid. *Officinal.* Acidulous fruits.

254. *Tannin*, when completely dried, is a brittle substance, of a black colour, and vitreous fracture; it is soluble in alcohol; it is much more soluble in hot than in cold water. The solution has a dark-brown colour, astringent taste, and peculiar smell; it is precipitated by acids, in the form of a viscid fluid, like pitch;

it is alſo precipitated by carbonate of potaſs in yellow flakes; it forms an inſoluble elaſtic precipitate with gelatin, and dark blue or black precipitates with iron. Mr Hatchett has lately prepared a ſpecies of tannin artificially, by the action of nitrous acid on charcoal. *Officinal.* Galls, uva urſi, tormentil, rhubarb, ſarſaparilla, St Lucie cinchona, ſwietenia, ſimarouba, filix mas, kino, catechu, ſalix.

Quaternary Oxides.

255. Gum when pure, is tranſparent and colourleſs, eaſily reduced to powder, without ſmell, and of a ſlightly ſweetiſh taſte. It is very ſoluble in water, and its ſolution is glutinous The ſolution of gum in water conſtitutes mucilage; it is thick and adheſive, and ſoon dries when expoſed to the air. Gum is alſo ſoluble in the weak acids; but is totally inſoluble in alcohol, which even precipitates it from mucilage. When triturated with a ſmall quantity of oil or reſin, it renders them miſcible with water. Gum is very little diſpoſed to ſpontaneous decompoſition: even mucilage may be kept for many years without change; but it is decompoſed by the ſtrong acids. By oxygenizement with nitric acid, it forms ſucceſſively mucous, malic, and oxalic acid; with oxy-muriatic acid it forms citric acid. When expoſed to heat, it does not melt, but ſoftens, ſwells, and becomes charred and incinerated. Its products are carbonic acid, and carburetted hydrogen gas, empyreumatic oil, and a conſiderable quantity of acetous acid, combined with a little ammonia. Fourcroy and Vauquelin ſay it conſiſts of 65.38 oxygen, 23.08 carbon, and 11.54 hydrogen. Cruickſhanks has however demonſtrated, that it contains nitrogen and lime, and has rendered it probable that it differs from ſugar in containing more carbon and leſs oxygen. *Officinal.* Gum Arabic, linſeed, quinceſeed.

256. *Tragacanth* is opaque and white, difficultly pulverizable, not ſweetiſh, very ſparingly ſoluble in water, but abſorbing and forming a paſte with a large quantity. Its ſolution is adheſive, but cannot be drawn out into threads. It moulds readily, and acquires a fetid ſmell. It is precipitated by nitrate of mercury. It is inſoluble in alcohol, and ſeems to contain more nitrogen and lime than gum does. *Officinal.* Tragacanth.

257. *Extractive* is ſoluble in water, eſpecially when hot, and in alcohol; it is alſo ſoluble in the weak acids, but is inſoluble in ether. It attracts moiſture from the atmoſphere; and when diſſolved in water, it abſorbs oxygen, and becomes inſoluble in water; it is alſo altered and precipitated by oxy-muriatic acid; it has a ſtrong affinity for alumina, and decompoſes ſeveral metallic ſalts. It is found in almoſt all plants, but can ſcarcely be

procured separate, so that its characters are not well ascertained. *Officinal.* Saffron, aloes.

258. *Gum-resins*, in strict propriety, should not be noticed here, as they are secondary compounds, and probably vary much in their nature. They seem to be compounds of resin with extractive and essential oil, and perhaps other immediate principles, not yet ascertained. *Officinal.* Gum ammoniac, galbanum, scammony, assafœtida, gamboge, myrrh, sagapenum, olibanum.

259. *Bitter principle*, (Thomson), intensely bitter, of a yellowish colour, ductile while soft, brittle while dry, not fusible, soluble in alcohol and in water, not crystallizable, precipitated by nitrate of silver, acetate of lead. *Officinal.* Quassia, gentian, colocynth, broom, simarouba, dandelion, colomba, marsh trefoil, lesser centaury, blessed thistle, different species of artemisia, cinchona jamaicensis.

260. *Narcotic principle* crystallizable, soluble in about 400 parts of boiling water, soluble in cold water, soluble in 24 parts of boiling alcohol, soluble in hot ether, in all acids, and in hot volatile oils, fusible, not volatile, highly narcotic. *Officinal.* Opium, lactuca, belladonna, hyosciamus, hemlock, stramonium.

261. *Acrid principle*, soluble in alcohol, water, acids and alkalies, rises in distillation with water and alcohol, volatile, not neutralized by alkalies or acids. *Officinal.* Squills, garlic, colchicum, asarum, arum, hellebore, bryony, iris, ranunculus, digitalis, viola, scurvygrass, mustard.

262 *Cinchonin*, not acrid, soluble in alcohol and in water, precipitated by infusion of galls; precipitate soluble in alcohol. *Officinal.* Cinchona officinalis, colomba, angustura, ipecacuan, piper, opium, capsicum.

263. *Indigo* has a deep blue colour, is light and friable, without taste or smell, insoluble in water, alcohol, ether, and oils, forming a deep blue solution with sulphuric acid when precipitated from acids; soluble in alkalies, becoming green. It is obtained from the indigofera tinctoria, and isatis tinctoria.

264. *Caoutchouc*, when smoke has not been employed in drying it, is of a white colour, soft, pliable, extremely elastic, and difficultly torn; specific gravity 0.9335; inalterable by exposure to air; insoluble in water, but softened, so that its edges may be made to adhere to each other; insoluble in alcohol; soluble, without alteration, in ether washed with water and in rectified petroleum; soluble in volatile oils; and fusible by heat, but altered, so that it remains glutinous after evaporation and cooling; inflammable; insoluble in alkalies, and decomposed by the strong acids. Its decomposition proves that it consists of carbon, hydrogen, nitrogen, and oxygen. It is obtained principally from Hævea caoutchouc and Jatropha elastica in South America, and the Fi-

cus Indica, Artocarpus integrifolia, and Urceola elaſtica in the Eaſt Indies.

265. *Suber* conſtitutes the epidermis of all vegetables. On the quercus ſuber it is thickened by art in a ſurpriſing degree, and forms common cork. It is a light elaſtic ſubſtance, very inflammable, burning with a bright white flame, and leaving a very ſpongy charcoal; it is not ſoluble in any menſtruum; it is decompoſed by nitric acid, and is converted into a peculiar acid, and an unctuous ſubſtance.

266. *Wood*, (Lignin?) when ſeparated from all the other matters with which it is combined in vegetables, is a pulverulent, fibrous, or lamellated body, more or leſs coloured, of conſiderable weight, without taſte or ſmell, and inſoluble in water or alcohol. When expoſed to ſufficient heat, it is decompoſed without melting or ſwelling, and is converted into charcoal without any change of form. Its products, by combuſtion, are carbonic acid, and carburetted hydrogen gas, water, empyreumatic oil, and acetous acid. By nitric acid, it is changed into the malic, oxalic, and acetous acids. It forms, as it were, the ſkeleton of all vegetables.

267. *Gelatin*, when exſiccated, is a hard, elaſtic, ſemi-tranſparent ſubſtance, reſembling horn, having a vitreous fracture: inalterable in the air, ſoluble in boiling water, and forming with it a gelatinous maſs on cooling; it is alſo ſoluble, but leſs readily, in cold water. It is ſoluble in acids, even when much diluted, and alſo in the alkalies. It is precipitated by tannin, with which it forms a thick, yellow precipitate, ſoon concreting into an adheſive, elaſtic maſs, readily drying in the air, and forming a brittle ſubſtance, of a reſinous appearance, exactly reſembling overtanned leather; very ſoluble in ammonia, and ſoluble in boiling water. It is alſo precipitated copiouſly by carbonate of potaſs, and by alcohol; both precipitates being ſoluble in water. The ſolution of gelatin in water, firſt becomes acid, and afterwards putrid. When decompoſed by nitric acid or heat, its products ſhew that it contains only a ſmall proportion of nitrogen. It is principally contained in the cellular, membranous, and tendinous parts of animals, and forms an important article of nouriſhment. Glue and iſinglaſs, which are much employed in the arts, are almoſt pure gelatin. *Officinal.* Iſinglaſs, cornu cervi.

268. *Albumen* is a brittle, tranſparent ſubſtance, of a pale yellow colour, and glutinous taſte, without ſmell, readily ſoluble in cold water, inſoluble in boiling water, but ſoftened and rendered opaque and white when thrown into it; inſoluble, and retaining its tranſparency in alcohol; ſwelling; becoming brown, and decrepitating when ſuddenly expoſed to heat. It generally exiſts in the form of a viſcid, tranſparent fluid, having little taſte or ſmell, and readily

ſoluble in cold water. When expoſed to a temperature of 165°, it coagulates into a white opaque maſs, of conſiderable conſiſtency; it is alſo coagulated by alcohol and acids, and remarkably by muriate of mercury. Albumen forms with tannin a yellow precipitate, inſoluble in water. *Coagulated albumen* is not ſoluble either in cold or in boiling water. It is ſoluble, but with decompoſition, in the alkalies and alkaline earths. It is alſo ſoluble in the acids, greatly diluted, but may be precipitated from them by tannin. When ſlowly dried, it becomes brittle, tranſparent and of a yellow colour, reſembling amber. When decompoſed by nitric acid or heat, it is found to contain more nitrogen than gelatin does. White of egg conſiſts of albumen, combined with a very little ſoda, ſulphur, and phoſphate of lime. Albumen alſo forms a large proportion of the ſerum of the blood, and is found in the ſap of vegetables. It is highly nutritious. *Officinal.* White of egg.

269. *Fibrin* is of a white colour, without taſte or ſmell, tough and elaſtic, but when dried, hard and almoſt brittle. It is not ſoluble in water or in alcohol. The concentrated cauſtic alkalies form with it a kind of fluid viſcid ſoap. It is diſſolved even by the weak and diluted acids; but it undergoes ſome change, by which it acquires the properties of jellying, and being ſoluble in hot water. By maceration in water, it becomes putrid, and is converted into adipocere. By long boiling in water, it is rendered tough and corneous. When decompoſed by heat or nitric acid, it is found to contain a large proportion of nitrogen. It forms the baſis of the muſcular fibre, and is contained in ſmall quantity in the blood. The gluten of wheat does not ſeem to differ from it in any important property. It is eminently nutritious.

270. *Urea* is obtained in the form of brilliant micaceous cryſtals, in groups, forming a maſs of a yellowiſh white colour, adhering to the veſſel containing it; difficult to cut or break; hard and granulated in its centre, gradually becoming ſoft, and of the conſiſtency of honey on its ſurface; of a ſtrong, diſguſting, alliaceous odour; of an acrid, pungent, diſagreeable taſte. It is deliqueſcent; its ſolution cauſes a ſenſible diminution of temperature; it is alſo ſoluble in alcohol, eſpecially when aſſiſted by heat. On cooling, the alcoholic ſolution depoſits cryſtals of pure urea. By the application of heat, it melts, ſwells rapidly, and at the ſame time begins to be decompoſed, emitting an inſupportably fetid odour, and is converted into carbonate of ammonia, and carburetted hydrogen gas. Urea is charred by concentrated ſulphuric acid; diluted ſulphuric acid aided by heat, is capable of converting it entirely into acetous acid and ammonia; concentrated nitrous acid decompoſes it with rapidity; diluted nitric acid, aided by heat, changes it almoſt entirely into carbonic acid gas and nitrogen gas; mu-

riatic acid diſſolves and preſerves it; oxy-muriatic acid converts it into ammonia and carbonic acid; potaſs aided by heat, converts it into the carbonate and acetate of ammonia. It influences the form of the cryſtallization of the muriates of ammonia and ſoda. The ſolution of urea in water varies in colour from a deep brown to pale yellow, according to its quantity. With eight parts of water it is perfectly fluid; it ſcarcely undergoes ſpontaneous decompoſition when pure, but the addition of ſome albumen occaſions it to putrefy rapidly. By repeated diſtillation it is completely converted into carbonate of ammonia. With nitric acid it forms a pearly cryſtalline precipitate; it alſo forms precipitates with the nitrates of lead, mercury, and ſilver. It is not precipitated by tannin or gallic acid. Urea is only obtained from urine by evaporating the ſolution of a thick extract of urine in alcohol.

Compound Acids.

271. The compound acids poſſeſs the properties of acids in general; but they are diſtinguiſhed from the acids with ſimple baſes, by their great alterability.

272. The ternary acids coincide nearly with the vegetable acids, and are characterized by their being converted entirely into water and carbonic acid when completely decompoſed by oxygen. They conſiſt of various proportions of carbon, hydrogen, and oxygen.

273. The quaternary acids coincide nearly with the animal acids; and are characterized by their furniſhing ammonia as well as water and carbonic acid when decompoſed.

Ternary Acids.

274. *Acetic acid* is a tranſparent and colourleſs fluid, of an extremely pungent ſmell and a cauſtic acid taſte, capable of reddening and bliſtering the ſkin. It is very volatile, and its vapour is highly inflammable; it combines with water in every proportion; it combines with ſugar, mucilage, volatile oils, alcohol; it diſſolves boracic acid, and abſorbs carbonic acid gas; it is formed by the acidification of ſugar, and by the decompoſition of ſome other ternary and quaternary compounds by heat or acids. It is decompoſed by the ſulphuric and nitric acids, and by heat. The proportions of its conſtituents are not aſcertained. In its ordinary ſtate, it has only an acid taſte, a pleaſant odour, ſpecific gravity 1.0005, congeals and cryſtallizes at —22°, and is vaporized at 212°. *Officinal.*

275. *Acetates* are very ſoluble in water; are decompoſed by heat, by expoſure of their ſolutions to the air, and by the ſtronger acids. *Officinal.* Acetate of potaſs, lead, mercury.

276. *Oxalic acid* is obtained in quadrangular cryſtals, tranſparent and colourleſs, of a very acid taſte. They are ſoluble in their own weight of water at 212°, and in about two waters at 65°. Boiling alcohol diſſolves ſomewhat more than half its weight, and at an ordinary temperature a little more than one-third. It is ſoluble in the muriatic and acetous acids. It is decompoſed by heat, ſulphuric acid, and nitric acid. According to Fourcroy, it conſiſts of 77 oxygen, 13 carbon, and 10 hydrogen.

277. *Oxalates* are decompoſed by heat; form a white precipitate with lime-water, which is ſoluble in acetic acid, after being expoſed to a red heat. The earthy oxalates are very ſparingly ſoluble in water; the alkaline oxalates are capable of combining with exceſs of acid, and become leſs ſoluble.

278. *Tartaric acid* varies in the forms of its cryſtals; its ſpecific gravity is 1.5962; it is permanent in the air; it is decompoſed by heat; it diſſolves readily in water, and the ſolution is not decompoſed by expoſure, unleſs very dilute; it may be changed by nitric acid into oxalic acid. According to Fourcroy, it conſiſts of 70.5 oxygen, 19.0 carbon, and 10.5 hydrogen. *Officinal.* Exiſts in tamarinds, grapes, &c.

279. *Tartrates*, by a red heat, are converted into carbonates. The earthy tartrates are ſcarcely ſoluble in water: the alkaline tartrates are ſoluble; but when combined with exceſs of acid, they become much leſs ſoluble. The tartaric acid is capable of combining at the ſame time with two baſes. When tartrates are digeſted in ſulphuric acid, the tartaric acid is ſeparated, and is recognized by forming a gritty precipitate with a ſolution of potaſs. *Officinal.* Super-tartrate of potaſs, tartrate of potaſs and ſoda.

280. *Citric acid* cryſtallizes in rhomboidal priſms, which ſuffer no change from expoſure to the air, and have an exceedingly acid taſte. When ſufficiently heated, they melt, ſwell, and emit fumes, and are partly ſublimed unchanged, and partly decompoſed. Water, at ordinary temperatures, diſſolves $\frac{1}{3}$ of its weight of theſe cryſtals; at 212° twice its weight. The ſolution undergoes ſpontaneous decompoſition very ſlowly. Sulphuric acid chars it, and forms vinegar. Nitric acid converts it into oxalic and acetic acids. *Officinal.* Orange and lemon juice, heps, &c.

281. *Citrates* are decompoſed by the ſtronger mineral acids, and alſo by the oxalic and tartaric, which form an inſoluble precipitate in their ſolutions. The alkaline citrates are decompoſed by a ſolution of barytes.

282. *Malic acid* is a viſcid fluid, incapable of cryſtallization, of a reddiſh-brown colour, and very acid taſte. It exiſts in the juice

of apples, and combined with lime in that of the common houſe-leek. It forms precipitates in the ſolution of the nitrates of mercury, lead, and ſilver. *Officinal.* Barberry, plumb, ſloe, elder, &c.

285. *Malates* having alkalies for their baſe, are deliqueſcent. The acidulous malate of lime is ſoluble in cold water.

286. *Gallic acid* cryſtallizes in brilliant colourleſs plates, of an acid and ſomewhat auſtere taſte, and of a peculiar odour when heated. It may be ſublimed without alteration, although a ſtrong heat decompoſes it in part. It is not altered by expoſure to the air, is ſoluble in $1\frac{1}{2}$ of water at 212°, and in 12 waters at 60°, and in four times its weight of alcohol. It has a ſtrong affinity for metallic oxides, eſpecially iron. It precipitates gold, copper, and ſilver brown, mercury orange, iron black, biſmuth yellow, and lead white. *Officinal.* It exiſts in nut galls, and in moſt aſtringent vegetable ſubſtances.

287. *Gallates* have not been examined.

288. *Mucic acid* is a white gritty powder, of a ſlightly acid taſte, ſoluble in 80 times its weight of boiling water.

289. *Mucates* of potaſs and ſoda are cryſtallizable. Mucates with earthy and metallic baſes are nearly inſoluble.

290. *Benzoic acid* cryſtallizes in compreſſed priſms of a pungent taſte and aromatic ſmell. It is fuſible, and evaporates by heat, for the moſt part, without change. When brought in contact with flame, it catches fire, and leaves no reſiduum. It is permanent in the air. It is very ſparingly ſoluble in cold water; but at 212° it diſſolves in about 24 waters. It is alſo ſoluble in hot acetic acid. It is ſoluble, without change, in alcohol, in concentrated ſulphuric and nitric acids, and is ſeparated from them by water. *Officinal.* In balſam of Tolu, of Peru, benzoin, ſtorax, &c.

291. *Benzoates*, little known, but generally forming feather-ſhaped cryſtals, and ſoluble in water.

292. *Succinic acid* cryſtallizes in tranſparent white triangular priſms; may be melted and ſublimed, but ſuffers partial decompoſition; more ſoluble in hot than in cold water; ſoluble in hot alcohol. *Officinal.*

293. *Succinates* little known.

294. *Camphoric acid* cryſtallizes in white parallelopipeds of a ſlightly acid bitter taſte, and ſmell of ſaffron, efloreſcing in the air; ſparingly ſoluble in cold water; more ſoluble in hot water; ſoluble in alcohol, the mineral acids, volatile and unctuous oils; melting and ſubliming by heat.

295. *Camphorates* have commonly a bitter taſte, burn with a

blue flame before the blowpipe, and are decomposed by heat, the acid subliming.

296. *Suberic acid* is not crystallizable, but is obtained either in the form of thin pellicles, or of a powder. At 60° it requires 140 times its weight of water for its solution; at 212° only twice its weight. When heated, it first melts, then becomes pulverulent, and at last sublimes. It changes the blue colour of a solution of indigo in sulphuric acid, of the nitrate of copper, and of the sulphate of copper to green, and gives a yellow colour to the green sulphate of iron, and to the sulphate of zinc.

297. *Suberates* have in general a bitter taste, and are decomposed by heat.

298. *Laccic acid* is obtained in the form of a reddish liquor, having a slightly bitter saltish taste, and the smell of new bread, by expression from the white lac of Madras; but on evaporation it assumes the form of acicular crystals. It rises in distillation. It decomposes with effervescence the carbonates of lime and soda. It renders the nitrate and muriate of barytes turbid. It assumes a green colour with lime water, and a purplish colour with sulphate of iron; and precipitates sulphuret of lime white, tincture of galls green, acetite of lead reddish, nitrate of mercury whitish, and tartrite of potass in the same way as tartarous acid does, except that the precipitate is not soluble in potass.

299. *Laccate* of lime bitterish, of soda deliquescent.

300. *Sebacic acid* has no smell, and a slightly acid taste. It is crystallizable, melts like fat, and is not volatile. It is so soluble in hot water as to become solid on refrigeration. It is also very soluble in alcohol. It precipitates the nitrates of lead, silver, and mercury, and the acetates of lead and mercury. It does not precipitate the waters of lime, baryta, or strontia.

301. *Sebates* are soluble salts.

Quaternary Acids.

302. *Prussic acid* is a colourless fluid, of a strong smell, like that of peach flowers or bitter almonds, and a sweetish pungent taste. It does not redden vegetable blues, and unites difficultly with the alkalies and earths. It is easily decomposed by light, heat, or oxygenized muriatic acid. It does not act upon the metals, but forms coloured and generally insoluble combinations with their oxides. It has a great tendency to form triple salts with alkaline and metallic bases. It is obtained from animal substances by the action of heat, nitric acid, fixed alkalies, and putrefaction. *Officinal.* Bitter almonds. Prunus lauro-cerasus.

303. *Prussiates* of alkalies are easily decomposed even by carbo-

nic acid. They form varioufly-coloured precipitates in the folutions of the metallic falts, except thofe of platinum.

304. *Amnic acid* is obtained in white, brilliant, acicular cryftals, of an acid tafte, reddening the tincture of turnfol, fparingly foluble in cold water, but fomewhat more foluble in hot water. It is foluble in alcohol. It is decompofed by heat.

305. *Amnates.* Very foluble in water, and the acid is precipitated from them in the form of a white cryftalline powder, by the other acids.

306. *Uric acid* is obtained in the form of acicular brilliant cryftals, of a pale yellow colour, almoft infoluble in cold, and very fparingly foluble in boiling water, but becoming very foluble when combined with an excefs of potafs or foda. It is decompofed at a high temperature, and furnifhes carbonate of ammonia, and carbonic acid, with very little oil or water, and leaves a charcoal which contains neither lime nor alkali. It is alfo decompofed by the nitric and oxygenized muriatic acids.

307. The *urates* are almoft infoluble in water. The fub-urates of foda and potafs are very foluble, and the uric acid is precipitated from their folutions even by the carbonic acid.

Characters of Salts derived from their Bases.

CLASS FIRST. *Alkaline falts.* Soluble in water, not precipitated by potafs or oxalic acid.

Genus I. *Potafs.* Sapid, bitter, cryftallizable, fufible, calcinable, vitrified or reduced to their bafe by heat, decompofed in general by baryta, rarely by lime. *Officinal.* Sulphate, nitrate, carbonate, fuper-tartrate, tartrate, acetate.

G. II. *Soda.* Sapid, bitter, cryftallizable, commonly containing much water of cryftallization, and therefore efflorefcent, and undergoing the watery fufion and exficcation before they are melted by the fire, decompofed by baryta and potafs. *Officinal.* Sulphate, muriate, phofphate, carbonate, tartrate, fub-borate.

G. III. *Ammonia.* Sapid, acrid, very foluble, either fublimed unchanged, or decompofed, lofing their bafe partially or totally by heat, bafe alfo expelled by baryta, potafs, foda, ftrontia, and lime. *Officinal.* Muriate, carbonate, acetate.

CLASS SECOND. *Earthy falts.* Either infoluble in water, or if foluble, precipitated by fulphuric acid, and carbonate of potafs.

G. I. *Baryta.* Generally infoluble in water, and indecompofable by fire, all poifonous and decompofed by the alkaline carbonates. *Officinal.* Sulphate, carbonate, and muriate.

G. II. *Strontia.* Generally infoluble in water, and indecompof-

able by fire, not poisonous, and decomposed by the alkaline carbonates, potass, soda, and baryta.

G. III. *Lime.* Generally sparingly soluble in water, decomposed by the alkaline carbonates, potass, soda, baryta, and strontia, and by oxalic acid. *Officinal.* Carbonate, muriate, phosphate.

G. IV. *Magnesia.* Generally soluble in water, and bitter, decomposed by baryta, potass, soda, strontia, and partially by ammonia. Magnesian salts, when added to ammoniacal salts, containing the same acid, quickly deposite crystals of a triple ammoniaco magnesian salt. *Officinal.* Sulphate, carbonate.

G. V. *Glucina.* Taste sweetish, decomposed by all the preceding bases; when recently precipitated by an alkali, soluble in carbonate of ammonia, precipitated by an infusion of nut-galls, and succinate of potass.

G. VI. *Alumina.* Generally soluble in water, taste sweetish, and styptic, decomposed by all the preceding bases; when recently precipitated soluble in the alkalies, and in sulphuric acid, precipitated by hydro-sulphuret of potass. *Officinal.* Supersulphate.

G. VII. *Yttria.* Sweetish styptic taste, decomposed by all the preceding bases, precipitated by prussiate of potass and iron, and by infusion of galls.

G. VIII. *Zirconia.* Taste austere, decomposed by all the preceding bases, precipitate not soluble in the alkalies, and when redissolved in muriatic acid, precipitated by hydro-sulphuret of potass, prussiate of potass and iron, and infusion of galls.

G. IX. *Silica.* Forms only one salt with fluoric acid, which is crystallizable, soluble in excess of acid, and in the alkaline fluates.

CLASS THIRD. *Metalline salts.*

1. Soluble in water, precipitated by hydro-sulphuret of potass.
2. Insoluble in water, fusible with borax into a coloured glass, or with charcoal into a metallic button.

G. I. *Gold.* Soluble in water, solution yellow, metal precipitated by sulphate of iron, sulphurous acid and infusion of galls, prussiate of potass and iron gives a yellowish white and muriate of tin a purplish precipitate.

G. II. *Platinum.* Solution in water brownish, not precipitated by prussiate of potass and iron, or infusion of galls, coloured bright red by muriate of tin, metal precipitated by sulphuretted hydrogen, precipitated orange by prussiate of mercury, and in small red crystals by potass and ammonia.

G. III. *Silver.* Metal precipitated by copper and sulphate of iron. Precipitated white by muriatic acid and the prussiates, black by hydro-sulphuret of potass, and yellowish brown by infusion of galls. *Officinal.* Nitrate.

G. IV. *Copper.* Soluble in water; solution blue or green, ren-

dered bright blue by ammonia, metal precipitated by iron, precipitated black by hydro-ſulphuret of potaſs, greeniſh yellow by pruſſiate of potaſs and iron, and brown by oxalic acid. *Officinal.* Sulphate.

G. V. *Iron.* Soluble in water. Solution green or browniſh red; precipitated blue by the triple pruſſiates, and purple or black by infuſion of galls. *Officinal.* Sulphate, tartrate, acetate, carbonate.

G. VI. *Lead.* Inſoluble ſalts eaſily reduced. Soluble ſalts, colourleſs; precipitated white by triple pruſſiate, infuſion of galls and zinc, and black by hydro-ſulphuret of potaſs. *Officinal.* Acetate, ſub-acetate.

G. VII. *Tin.* Soluble, not precipitated by infuſion of galls; precipitated white by triple pruſſiate and lead, black by hydro-ſulphuret of potaſs, and brown by ſulphuretted hydrogen.

G. VIII. *Zinc.* Soluble; colourleſs; not precipitated by any metal or infuſion of galls; precipitated white by alkalies, triple pruſſiate, hydro-ſulphuret of potaſs, and ſulphuretted hydrogen. *Officinal.* Sulphate.

G. IX. *Mercury.* Volatile; precipitate by copper metallic, by triple pruſſiate and muriatic acid, white, by hydro-ſulphuret of potaſs, black, and by infuſion of galls orange. *Officinal.* Muriate, ſub-muriate, ſub-ſulphate.

G. X. *Tellurium.* Not precipitated by triple pruſſiate. Precipitate by zinc black and metallic, by hydro-ſulphuret of potaſs brown, by infuſion of galls yellow, and by alkalies white, and ſoluble when the alkali is added in exceſs.

G. XI. *Antimony.* Precipitate by iron or zinc black, by hydro-ſulphuret of potaſs orange. *Officinal.* Muriate, phoſphate, tartrate.

G. XII. *Biſmuth.* Solution colourleſs. Precipitate by copper metallic, by water and triple pruſſiate white, by infuſion of galls orange, and by hydro-ſulphurets black.

G. XIII. *Mangancſe.* Soluble, not precipitated by gallic acid. Precipitate by alkalies, triple pruſſiate and hydro-ſulphurets white.

G. XIV. *Nickel.* Salts ſoluble; colour green; precipitate by triple pruſſiate dull green, by hydro-ſulphuret black, by infuſion of galls greyiſh white, and by iron, &c. metallic.

G. XV. *Cobalt.* Soluble, reddiſh, precipitate by alkalies blue or reddiſh brown, by triple pruſſiate brown with a ſhade of blue.

G. XVI. *Uranium.* Soluble, yellow, precipitate by alkalies yellow, by alkaline carbonates white, ſoluble in exceſs of alkali, by triple pruſſiate browniſh red, by hydro-ſulphuret of potaſs browniſh yellow, and by infuſion of galls chocolate.

G. XVII. *Titanium.* Precipitate by alkaline carbonates flaky white, by triple pruſſiate and hydro-ſulphuret green, and by infuſion of galls reddiſh brown, ſolution coloured red by tin, and blue by zinc.

G. XVIII. *Chromum.* Precipitate by triple pruſſiate and hydro-ſulphuret green, and by infuſion of galls brown.

G. XIX. *Molybdenum.* Solutions blue, precipitate by triple pruſſiate and tincture of galls brown.

G. XX. *Tungsten.* Unknown.

G. XXI. *Arſenic.* Precipitate by water and triple pruſſiate white, by hydro-ſulphuret of potaſs yellow.

G. XXII. *Columbium.* Colourleſs; precipitate by alkaline carbonates and zinc white, by triple pruſſiate green, by hydro-ſulphuret of ammonia chocolate, and by tincture of galls orange.

SECT. II.

PHARMACEUTICAL OPERATIONS.

Collection and Preservation of Simples.

308. EACH of the kingdoms of nature furniſhes articles which are employed in medicine, either in their natural ſtate, or after they have been prepared by the art of pharmacy.

309. In collecting theſe, attention muſt be paid to ſelect ſuch as are moſt ſound and perfect, to ſeparate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

310. Thoſe precautions muſt be taken which are beſt fitted for preſerving them. They muſt in general be defended from the effects of moiſture, too great heat or cold, and confined air.

311. When their activity depends on volatile principles, they muſt be preſerved from the contact of the air as much as poſſible.

312. As the vegetable kingdom preſents us with the greateſt number of ſimples, and the ſubſtances belonging to it are the leaſt conſtant in their properties, and moſt ſubject to decay, it becomes neceſſary to give a few general rules for their collection and preſervation.

313. Vegetable matters ſhould be collected in the countries where they are indigenous; and thoſe which grow wild, in dry ſoils and high ſituations, fully expoſed to the air and ſun, are in

general to be preferred to thoſe which are cultivated, or which grow in moiſt, low, ſhady, or confined places.

314. Roots which are annual, ſhould be collected before they ſhoot out their ſtalks or flowers; biennial roots in the harveſt of the firſt, or ſpring of the ſecond year; perennial roots either in ſpring before the ſap has begun to mount, or in harveſt, after it has returned.

315. Thoſe which are worm-eaten, except ſome reſinous roots, or which are decayed, are to be rejected. The others are immediately to be cleaned with a bruſh and cold water, letting them lie in it as ſhort time as poſſible; and the fibres and little roots, when not eſſential, are to be cut away.

316. Roots which conſiſt principally of fibres, and have but a ſmall tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by ſimply expoſing them, and frequently turning them in a current of cold, dry, air: if very thick and ſtrong, they are to be ſplit or cut into ſlices, and ſtrung upon threads; if covered with a tough bark, they may be peeled freſh, and then dried. Farinaceous roots are to be dipped in boiling water, before they are dried. Such as loſe their virtues by drying, or are directed to be preſerved in a freſh ſtate, are to be kept buried in dry ſand.

317. No very general rule can be given for the collection of herbs and leaves, ſome of them acquiring activity from their age, and others, as the mucilaginous leaves, from the ſame cauſe, loſing the property for which they are officinal. Aromatics are to be collected after the flower-buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they ſhoot; and perennials, before they flower, eſpecially if their fibres become woody.

318. They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are uſually tied in bundles, and hung up in a ſhady, warm, and airy place; or ſpread upon the floor, and frequently turned. If very juicy, they are laid upon a ſieve, and dried by a gentle degree of artificial warmth.

319. Sprouts are collected before the buds open; and ſtalks are gathered in autumn.

320. Barks and woods are collected when the moſt active part of the vegetables are concentrated in them, which happens in ſpring and in autumn. Spring is preferred for reſinous barks, and autumn for the others which are not reſinous, but rather gummy. Barks ſhould be taken from young trees, and freed from decayed parts, and all impurities.

321. The ſame rules direct the collection of woods; but they

must not be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

322. Flowers are collected in clear dry weather, before noon, but after the dew is off: either when they are just about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: These are called heads or tops.

323. Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth, and in some cases they should be put up in paper bags. When they loose their colour and smell they are unfit for use.

324. Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. The emulsive and farinaceous seeds, are to be dried in an airy, cool place: the mucilaginous seeds by the heat of a stove. Some pulpy fruits are freed from their core and seeds, strung upon thread, and dried artificially, by exposing them repeatedly to the heat of a stove. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled, and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then no longer fit for medical use, no very large quantity of them should be collected at a time.

325. The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade, and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an error, for they always loose infinitely more by slow than by quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and exposed to a free current of air. When perfectly dry and friable, they have little smell; but after being kept some time, they attract moisture from the air, and regain their proper odour.

326. The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, of a delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool, and dry, but by no means in a warm, or moist place.

327. Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose

properties are more permanent, and not ſubject to decay, will keep for ſeveral years.

328. Vegetables collected in a moiſt and rainy ſeaſon, are in general more watery and apt to ſpoil. In a dry ſeaſon, on the contrary, they contain more oily and reſinous particles, and keep much better.

Mechanical Operations of Pharmacy.

a. The determination of the weight and bulk of bodies.
b. The diviſion of bodies into more minute particles.
c. The ſeparation of their integrant parts by mechanical means.
d. Their mixture, when not attended by any chemical action.

329. The quantities of ſubſtances employed in pharmaceutical operations, are moſt accurately determined by the proceſs called weighing. For this purpoſe, there ſhould be ſets of beams and ſcales of different ſizes; and it would be adviſable to have a double ſet, one for ordinary uſe, and another for occaſions when greater accuracy is neceſſary. A good beam ſhould remain in equilibrium without the ſcales, and when the ſcales are changed; and it ſhould turn ſenſibly with a very ſmall proportion of the weight with which it is loaded. Balances ſhould be defended as much as poſſible from acid and other corroſive vapours, and ſhould not be left ſuſpended longer than is neceſſary, as it impairs their delicacy very much. For the ſame reaſon, balances ſhould never be overloaded.

330. The want of uniformity of weights and meaſures is attended with many inconveniencies. In this country, druggiſts and grocers ſell by avoirdupois weight; and the apothecaries are directed to ſell by troy weight, although, in fact, they ſeldom uſe the troy weight for more than two drachms. Hence ariſe numerous and culpable errors, the troy pound being leſs than the avoirdupois, and the ounce and drachm being greater. Comparative tables of the value of the troy, avoirdupois, and new French decimal weight, are given in the appendix.

331. The errors ariſing from the promiſcuous uſe of weights and meaſures, have induced the Edinburgh and Dublin colleges to reject the uſe of meaſures entirely, and to direct that the quantities of every thing fluid, as well as ſolid, ſhall be determined by troy weight: But as the London college have given their ſanction to the uſe of meaſures, and as, from the much greater facility of their employment, apothecaries will always uſe them, tables of meaſures are alſo inſerted in the appendix.

332. For meaſuring fluids, the graduated glaſs meaſures are always to be preferred: They ſhould be of different ſizes, according to the quantities they are intended to meaſure. Elaſtic fluids are alſo meaſured in glaſs tubes, graduated by inches and their decimals.

333. Specific gravity is the weight of a determinate bulk of any body. As a ſtandard of compariſon, diſtilled water has been aſſumed as unity. The ſpecific gravity of ſolids is aſcertained, by comparing the weight of the body in the air with its weight when ſuſpended in water. The quotient obtained by dividing its weight in air, by the difference between its weight in air and its weight in water, is its ſpecific gravity. The ſpecific gravity of fluids may be aſcertained by comparing the weight of a ſolid body, ſuch as a piece of cryſtal, when immerſed in diſtilled water, with its weight when immerſed in the fluid we wiſh to examine; by dividing its loſs of weight in the fluid by its loſs of weight in the water, the quotient is the ſpecific gravity of the fluid: Or a ſmall phial, containing a known weight of diſtilled water, may be filled with the fluid to be examined and weighed, and by dividing the weight of the fluid by the weight of the water, the ſpecific gravity is aſcertained.

Although theſe are the only general principles by which ſpecific gravities are aſcertained, yet as the reſult is always influenced by the ſtate of the thermometer and barometer at the time of the experiments, and as the manipulation is a work of great nicety, various ingenious inſtruments have been contrived to render the proceſs and calculation eaſy. Of all theſe, the gravimeter of Morveau ſeems to deſerve the preference.

It would be of material conſequence to ſcience and the arts, if ſpecific gravities were always indicated by the numerical term expreſſing their relation to the ſpecific gravity of diſtilled water. This however is unfortunately not the caſe. The exciſe in this country collect the duties paid by ſpiritous liquors, by eſtimating the proportion which they contain of a ſtandard ſpirit, about 0.933 in ſpecific gravity, which they call hydrometer proof, and they expreſs the relation which ſpirits of a different ſtrength have to the ſtandard ſpirit by ſaying that they are above or under hydrometer proof. Thus one to ſix, or one in ſeven below hydrometer proof means, that it is equal in ſtrength to a mixture of ſix parts of proof ſpirit with one of water.

The only other mode of expreſſing ſpecific gravities, which it is neceſſary to notice, is that of Baumé's areometer, as it is often uſed in the writings of the French chemiſts, and is little underſtood in this country. For ſubſtances heavier than water he aſſumes the ſpecific gravity of diſtilled water as zero, and graduates the ſtem of his inſtrument downwards, each degree being ſuppoſed by him to expreſs the number of parts of muriate of ſoda contained in a

given solution, which however is not at all the case. For substances lighter than water the tube is graduated upward, and this zero is afforded by a solution of 1 of salt in 9 water. In the appendix tables are given of the specific gravities, corresponding with all the degrees of both of these areometers, from Nicholson's Journal.

Mechanical Division.

334. By mechanical division, substances are reduced to a form better adapted for medical puposes; and by the increase of their surface, their action is promoted, both as medical and chemical agents.

335. It is performed by cutting, bruising, grinding, grating, rasping filing, pulverization, trituration, and granulation, by means of machinery or of proper instruments.

336. *Pulverization* is the first of these operations that is commonly employed in the apothecary's shop. It is performed by means of pestles and mortars. The bottom of the mortars should be concave; and their sides should neither be so inclined as not to allow the substances operated on to fall to the bottom between each stroke of the pestle, nor so perpendicular as to collect it too much together, and to retard the operation. The materials of which the pestles and mortars are formed, should resist both the mechanical and chemical action of the substances for which they are used. Wood, iron, marble, siliceous stones, porcelain, and glass, are all employed; but copper, and metals containing copper, are to be avoided.

337. They should be provided with covers, to prevent the finest and lightest parts from escaping, and to defend the operator from the effects of disagreeable or noxious substances. But these ends are more completely attained, by tying a piece of pliable leather round the pestle and round the mouth of the mortar. It must be closely applied, and at the same time so large, as to permit the free motion of the pestle.

338. In some instances, it will be even necessary for the operator to cover his mouth and nostrils with a wet cloth, and to stand with his back to a current of air, that the very acrid particles which arise may be carried from him.

339. The addition of a little water or spirit of wine, or of a few almonds, to very light and dry substances, will prevent their flying off. But almonds are apt to induce rancidity, and powders are always injured, by the drying which is necessary when they have been moistened. Water must never be added to substances which absorb it, or are rendered cohesive by it.

340. Too great a quantity of any substance must never be put into the mortar at a time, as it very much retards the operation.

341. All vegetable ſubſtances muſt be previouſly dried. Reſins and gummy reſins, which become ſoft in ſummer, muſt be powdered in very cold weather, and muſt be beaten gently, or they will be converted into a paſte, inſtead of being powdered. Wood, roots, barks, horn, bone, ivory, &c. muſt be previouſly cut, ſplit, chipped or raſped. Fibrous woods and roots ſhould be finely ſhaved after their bark is removed, for otherwiſe, their powders will be full of hair-like filaments, which can ſcarcely be ſeparated. Some ſubſtances will even require to be moiſtened with mucilage of tragacanth, or of ſtarch, and then dried before they can be powdered. Camphor may be conveniently powdered by the addition of a little ſpirit of wine, or almond oil. The emulſive ſeeds cannot be reduced to powder, unleſs ſome dry powder be added to them. To aromatic oily ſubſtances, ſugar is the beſt addition.

342. All impurities and inert parts having been previouſly ſeparated, the operation muſt be continued and repeated upon vegetable ſubſtances, till no reſiduum is left. The powders obtained at different times muſt then be intimately mixed together, ſo as to bring the whole to a ſtate of perfect uniformity.

343. Very hard ſtony ſubſtances muſt be repeatedly heated to a red heat, and then ſuddenly quenched in cold water, until they become ſufficiently friable. Some metals may be powdered hot in a heated iron mortar, or may be rendered brittle by alloying them with a little mercury.

344. *Trituration* is intended for the ſtill more minute diviſion of bodies. It is performed in flat mortars of glaſs, agate, or other hard materials, by giving a rotatory motion to the peſtle; or on a levigating ſtone, which is generally of porphyry, by means of a muller of the ſame ſubſtance. On large quantities it is performed by rollers of hard ſtone, turning horizontally upon each other, or by one vertical roller turning on a flat ſtone.

345. The ſubſtances ſubjected to this operation are generally previouſly powdered or ground.

346. *Levigation* differs from trituration only in the addition of water or ſpirit of wine to the powder operated upon, ſo as to form the whole maſs into a kind of paſte, which is rubbed until it be of ſufficient ſmoothneſs or fineneſs. Earths, and ſome metallic ſubſtances, are levigated.

347. *Granulation* is employed for the mechanical diviſion of ſome metals. It is performed, either by ſtirring the melted metal with an iron-rod until it cools, or by pouring it into water, and ſtirring it continually as before, or by pouring it into a covered box, previouſly well rubbed with chalk, and ſhaking it until the metal cools, when the rolling motion will be converted into a

rattling one. The adhering chalk is then to be washed away.

MECHANICAL SEPARATION.

348. *Sifting.* From dry substances, which are reduced to the due degree of minuteness, the coarser particles are to be separated by sieves of iron-wire, hair-cloth or gauze, or by being dusted through bags of fine linen. For very light and valuable powders, or acrid substances, compound sieves, having a close lid and receiver must be used. The particles which are not of sufficient fineness to pass through the interstices of the sieve, may be again powdered.

349. *Elutriation* is confined to mineral substances, on which water has no action. It is performed for separating them from foreign particles and impurities, of a different specific gravity, in which case they are said to be washed; or for separating the impalpable powders, obtained by trituration and levigation from the coarser particles. This process depends upon the property that very fine or light powders have of remaining for some time suspended in water; and is performed by diffusing the powder or paste formed by levigation through plenty of water, letting it stand a sufficient time, until the coarser particles settle at the bottom, and then pouring off the liquid in which the finer or lighter particles are suspended. Fresh water may be poured on the residuum, and the operation repeated; or the coarser particles, which fall to the bottom, may be previously levigated a second time.

350. *Decantation.* The fine powder which is washed over with the water, is separated from it, by allowing it to subside completely, and by either decanting off the water very carefully, or by drawing it off by a syringe or syphon. These processes are very frequently made use of for separating fluids from solids which are specifically heavier, especially when the quantity is very large, or the solid so subtile as to pass through the pores of most substances employed for filtration, or the liquid so acrid as to corrode them.

351. *Filtration.* For the same purpose of separating fluids from solids, straining and filtration are often used. These differ only in degree, and are employed when the powder either does not subside at all, or too slowly and imperfectly for decantation.

352. The instruments for this purpose are of various materials, and must in no instance be acted upon by the substances for which they are employed. Fats, resins, wax and oils, are strained through hemp or flax spread evenly over a piece of wire-cloth or net stretched in a frame. For saccharine and mucilaginous liquors, fine flannel may be used; for some saline solutions, linen. Where these are not fine enough, unsized paper is employed, but it is ex-

tremely apt to burst by hot watery liquors which dissolve its size; and very acrid liquors, such as acids, are filtered by means of a glass funnel, filled with powdered quartz, a few of the larger pieces being put in the neck, smaller pieces over these, and the fine powder placed over all. The porosity of this last filter retains much of the liquor; but it may be obtained by gently pouring on it as much distilled water; the liquor will then pass through, and the water be retained in its place.

353. Water may be filtrated in large quantities through basins of porous stone, or artificial basins of nearly equal parts of fine clay and coarse sand. In large quantities it may be easily purified *per ascensum*, the purified liquor and impurities thus taking opposite directions. The simplest apparatus of this kind is a barrel, divided perpendicularly into two, by a board perforated with a row of holes along the lower edge. Into each side, as much well washed sand is put as will cover these holes an inch or two, over which must be placed a layer of pebbles to keep it steady. The apparatus is now fit for use. Water poured into the one half will sink through the sand in that side, pass through the holes in the division to the other, and rise through the sand in the other half, from which it may be drawn by a stop-cock.

354. The size of the filters depends on the quantity of matter to be strained. When large, the flannel or linen is formed into a conical bag, and suspended from a hoop or frame; the paper is either spread on the inside of these bags, or folded into a conical form, and suspended by a funnel. It is of advantage to introduce glass rods or quill barrels between the paper and funnel, to prevent them from adhering too closely.

355. What passes first is seldom fine enough, and must be poured back again, until by the swelling of the fibres of the filter, or filling up of its pores, the fluid acquires the requisite degree of limpidity. The filter is sometimes covered with charcoal powder, which is a useful addition to muddy and deep-coloured liquors. The filtration of some viscid substances is much assisted by heat.

356. *Expression* is a species of filtration, assisted by mechanical force. It is principally employed to obtain the juices of fresh vegetables, and the unctuous vegetable oils. It is performed by means of a screw press with plates of wood, iron or tin. The subject of the operation is previously beaten, ground or bruised. It is then inclosed in a bag, which must not be too much filled, and introduced between the plates of the press. The bags should be of hair-cloth, or canvass inclosed in hair-cloth. Hempen and woollen bags are apt to give vegetable juices a disagreeable taste. The pressure should be gentle at first, and increased gradually.

357. Vegetables intended for this operation ſhould be perfectly freſh and freed from all impurities. In general they ſhould be expreſſed as ſoon as they are bruiſed, for it diſpoſes them to ferment; but ſubacid fruits give a larger quantity of juice and of finer quality, when they are allowed to ſtand ſome days in a wooden or earthen veſſel after they are bruiſed. To ſome vegetables which are not juicy enough for themſelves, the addition of a little water is neceſſary. Lemons and oranges muſt be peeled, as their ſkins contain a great deal of eſſential oil, which would mix with the juice. The oil itſelf may be obtained ſeparately, by expreſſion with the fingers againſt a plate of glaſs.

358. For unctuous ſeeds iron-plates are uſed; and it is cuſtomary not only to heat the plates, but to warm the bruiſed ſeeds in a kettle over the fire, after they have been ſprinkled with ſome water, as by theſe means the product is increaſed, and the oil obtained is more limpid. But as their diſpoſition to rancidity is increaſed by it, if poſſible this practice ſhould be laid aſide, or confined to expoſing the bruiſed ſeeds, incloſed in a bag, to the ſteam of hot water.

359. *Deſpumation* is generally practiſed on thick and clammy liquors, which contain much ſlimy and other impurities, not eaſily ſeparable by filtration. The ſcum ariſes either by ſimply heating the liquor, or by *clarifying* it, which is done by mixing with the liquor, when cold, the whites of eggs well beaten with a little water, which on being heated coagulates, and entangling the impurities of the liquor, riſes with them to the ſurface, and may eaſily be removed by a perforated ladle. Or the liquor may now be filtered with eaſe. Spiritous liquors are clarified by means of iſinglaſs diſſolved in water, or any albuminous fluid, ſuch as milk, which coagulates by the action of alcohol without the aſſiſtance of heat. Some expreſſed juices, ſuch as thoſe of the antiſcorbutic plants, are inſtantly clarified by the addition of vegetable acid, ſuch as the juice of bitter oranges.

360. Fluids can only be ſeparated from each other, when they have no tendency to combine, and when they differ in ſpecific gravity. The ſeparation may be effected by ſkimming off the lighter fluid with a ſilver or glaſs ſpoon; or by drawing it off by a ſyringe or ſyphon; or by means of a glaſs ſeparatory, which is an inſtrument having a projecting tube, terminating in a very ſlender point, through which the heavier fluid alone is permitted to run; or by means of the capillary attraction of a ſpongy woollen thread; for no fluid will enter a ſubſtance whoſe pores are filled by another, for which it has no attraction; and, laſtly, upon the ſame principle, by means of a filter of unſized paper, previouſly ſoaked in one of the fluids, which in this way readily paſſes through it, while the other remains behind.

361. *Mechanical mixture* is performed by agitation, trituration, or kneading; but these will be best considered in treating of the forms in which medicines are exhibited.

APPARATUS.

362. Before entering on the chemical operations, it will be necessary to make a few remarks on the instruments employed in performing them. They may be divided into

a. The vessels in which the effects are performed.
b. The means of producing heat; or fuel; and
c. The means of applying and regulating the heat; or lamps and furnaces.

VESSELS.

363. The vessels, according to the purposes for which they are intended, vary

a. In form, and
b. In materials.

364. The different forms will be best described when treating of the particular operations.

365. No substance possesses properties which would render it proper to be employed as a material in every instance. We are therefore obliged to select those substances which possess the properties more especially required in the particular operations for which they are intended.

366. The properties most generally required, are

a. The power of resisting chemical agents.
b. Transparency.
c. Compactness.
d. Strength.
e. Fixity and infusibility.
f. And the power of bearing sudden variations of temperature without breaking.

367. The metals in general possess the four last properties in considerable perfection, but they are all opaque. Iron and copper are apt to be corroded by chemical agents, and the use of the latter is often attended by dangerous consequences. These defects are in some measure, but not entirely, remedied by tinning them. Tin and lead are too fusible. Platinum, gold, and silver, resist most of the chemical agents, but their expence is an insurmountable objection to their general use.

368. Good earthen-ware resists the greatest intensity of heat, but is deficient in all the other properties. The basis of all kinds of earthen-ware is clay, which possesses the valuable quality of being very plastic when wrought with water, and of becoming extremely hard when burnt with an intense heat. But it contracts

ſo much by heat, that it is extremely apt to crack and ſplit on being expoſed to ſudden changes of temperature; it is therefore neceſſary to add ſome ſubſtance which may counteract this property. Siliceous ſand, clay reduced to powder, and then burnt with a very intenſe heat, and plumbago, are occaſionally uſed. Theſe additions, however, are attended with other inconveniencies; plumbago eſpecially is liable to combuſtion, and ſand diminiſhes the compactneſs; ſo that when not glazed, they are porous, and when glazed, they are acted upon by chemical agents. The chemical veſſels, manufactured by Meſſrs Wedgwood, are the beſt of this deſcription, except porcelain, which is too expenſive.

369. Glaſs poſſeſſes the three firſt qualities in an eminent degree, and may be heated red-hot without melting. Its greateſt inconvenience is its diſpoſition to crack or break in pieces when ſuddenly heated or cooled. As this is occaſioned by its unequal expanſion or contraction, it is beſt remedied by forming the veſſels very thin, and giving them in general a rounded form. Glaſs-veſſels ſhould alſo be well annealed, that is, cooled very ſlowly, after being blown, by placing them immediately in an oven while they are yet in a ſoft ſtate. While ill annealed, or cooled ſuddenly, glaſs is apt to fly in pieces on the ſlighteſt change of temperature, or touch of a ſharp point. We ſometimes take advantage of this imperfection; for by means of a red-hot wire, glaſs-veſſels may be cut into any ſhape. When there is not a crack already in the glaſs, the point of the wire is applied near the edge, a crack is formed, which is afterwards eaſily led in any direction we wiſh.

370. Reaumur's porcelain, on the contrary, is glaſs, which by ſurrounding it with hot ſand, is made to cool ſo ſlowly, that it aſſumes a cryſtalline texture, which deſtroys its tranſparency, but imparts to it every other quality wiſhed for in chemical veſſels. The coarſer kinds of glaſs are commonly uſed in making it; but as there is no manufacture of this valuable ſubſtance, its employment is ſtill very limited.

Lutes.

371. Lutes alſo form a neceſſary part of chemical apparatus. They are compoſitions of various ſubſtances, intended

a. To cloſe the joining of veſſels.
b. To coat glaſs-veſſels.
c. To line furnaces.

372. Lutes of the firſt deſcription are commonly applied to confine elaſtic vapours. They ſhould therefore poſſeſs the following properties,

a. Viſcidity, plaſticity, and compactneſs.
b. The power of reſiſting acrid vapours.

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a. Viſcidity, plaſticity, and compactneſs.
b. The power of reſiſting acrid vapours.
c. The power of reſiſting certain degrees of heat.

373. The viſcidity of lutes depends on the preſence either of

a. Unctuous or reſinous ſubſtances.
b. Mucilaginous ſubſtances, or
c. Clay or lime.

374. Lutes of the firſt kind (373. *a*.) poſſeſs the two firſt claſs of properties in an eminent degree; but they are in general ſo fuſible that they cannot be employed when they are expoſed even to very low degrees of heat, and they will not adhere to any ſubſtance that is at all moiſt. Examples.

a. Eight parts of yellow wax, melted with one of oil of turpentine, with or without the addition of reſinous ſubſtances, according to the degree of pliability and conſiſtence required. Lavoiſier's lute.
b. Four parts of wax, melted with two of varniſh and one of olive oil. Sauſſure's lute.
c. Three parts of powdered clay, worked up into a paſte, with one of drying oil, or, what is better, amber varniſh. The drying oil is prepared by boiling 22.5 parts of litharge in 16 of linſeed oil until it be diſſolved. Fat lute.
d. Chalk and oil, or glazier's putty, is well fitted for luting tubes permanently into glaſs veſſels, for it becomes ſo hard that it cannot be eaſily removed.
e. Equal parts of litharge, quicklime, and powdered clay, worked into a paſte with oil varniſh, is ſometimes uſed

to daub over the cracks in glafs veffels, fo as to render them again fit for fome purpofes.

f. Melted pitch and brick duft.

375. Mucilaginous fubftances (373. *b.*) fuch as flour, ftarch, gum, and glue, mixed with water, with or without fome powder, are fufficiently adhefive, are dried by moderate degrees of heat, and are eafily removed after the operation, by moiftening them with water; but a high temperature deftroys them, and they do not refift corrofive vapours. Examples.

a. Slips of bladder macerated in water, and applied with the infide next the veffels. They are apt, however, from their great contraction in drying, to break weak veffels.

b. One part of gum arabic with fix or eight of chalk, formed into a pafte with water.

c. Flour worked into a pafte with powdered clay or chalk.

d. Almond or linfeed meal formed into a pafte with mucilage or water.

e. Quicklime in fine powder, haftily mixed with white of egg, and inftantly applied, fets very quickly, but becomes fo hard that it can fcarcely be removed.

f. Slaked lime in fine powder, with glue, does not fet fo quickly as the former.

g. The cracks of glafs veffels are fometimes mended by daubing them and a fuitable piece of linen over with white of egg, ftrewing both over with finely powdered quicklime, and inftantly applying the linen clofely and evenly.

376. Earthy lutes (373. *c.*) refift very high temperatures, but they become fo hard that they can fcarcely be removed, and often harden fo quickly after they are mixed up, that they muft be applied immediately. Examples.

a. Quicklime well incorporated with a fixth part of muriate of foda.

b. Burnt gypfum, made up with water.

c. One ounce of borax diffolved in a pound of boiling water, mixed with a fufficient quantity of powdered clay. Mr. Watt's fire lute.

d. One part of clay with four of fand, formed into a pafte with water. This is alfo ufed for coating glafs veffels, in order to render them ftronger, and capable of refifting violent degrees of heat. It is then made into a very thin mafs, and applied in fucceffive layers, tak-

ing care that each coat be perfectly dry before another be laid on.

377. The lutes for lining furnaces will be described when treating of furnaces.

378. The junctures of vessels which are to be luted to each other, must previously be accurately and firmly fitted, by introducing between them, when necessary, short bits of wood or cork, or, if the disproportion be very great, by means of a cork fitted to the one vessel, having a circular hole bored through it, through which the neck of the other vessel or tube passes.

379. After being thus fitted, the lute is either applied very thin, by spreading it on slips of linen or paper, and securing it with thread, or if it is a paste lute, it is formed into small cylinders, which are successively applied to the junctures, taking care that each piece be made to adhere firmly and perfectly close in every part before another is put on. Lastly, the whole is secured by slips of linen or bladder.

380. In many cases, to permit the escape of elastic vapours, a small hole is made through the lute with a pin, or the lute is perforated by a small quill, fitted with a stopper.

Heat and Fuel.

381. As caloric is an agent of the most extensive utility in the chemical operations of pharmacy, it is necessary that we should be acquainted with the means of employing it in the most economical and efficient manner.

382. The rays of the sun are used in the drying of many vegetable substances, and the only attentions necessary are to expose as large a surface as possible, and to turn them frequently, that every part may be dried alike. They are also sometimes used for promoting spontaneous evaporation.

383. The combustion of different substances is a much more powerful and certain source of heat. The substances employed for this purpose are either fluid or solid. Alcohol, oil, tallow, wood, turf, coal, charcoal, and coke, are all occasionally employed.

384. Alcohol, oil, and melted tallow, fluid inflammables, must be burnt on porous wicks. These act merely mechanically, by drawing up a portion of the fluid to be volatilized and inflamed. They are therefore burnt in lamps of various constructions. But although commonly used to produce light, they afford a very uniform, though not very high temperature. It may however be increased by increasing the number of the wicks and their size.

Alcohol produces a ſteady heat, no ſoot, and, if ſtrong, leaves no reſiduum. Oil gives a higher temperature, but on a common wick produces much ſmoke and ſoot. Theſe are diminiſhed, and the light and heat increaſed, by making the ſurface of the flame bear a large proportion to the centre, which is beſt done by a cylindrical wick, ſo contrived that the air has free acceſs both to the outſide and to the inſide of the cylinder, as in Argand's lamp, invented by Mr. Boulton of Birmingham. In this way oil may be made to produce a conſiderable temperature, of great uniformity, and without the inconvenience of ſmoke.

385. Wicks have the inconvenience of being charred by the high temperature to which they are ſubjected, and becoming ſo clogged as to prevent the fluid from riſing in them. They muſt then be trimmed, but this is ſeldomer neceſſary with alcohol and fine oils than with the coarſer oils. Lamps are alſo improved by adding a chimney to them. It muſt admit the free acceſs of air to the flame, and then it increaſes the current, confines the heat, and ſteadies the flame. The intenſity of the temperature of flame may be increaſed aſtoniſhingly by forcing a ſmall current of hot air through it as by the blow pipe.

386. Wood, turf, coal, charcoal, and coke, ſolid combuſtibles, are burnt in grates and furnaces. Wood has the advantage of kindling readily, but affords a very unſteady temperature, is inconvenient from its flame, ſmoke, and ſoot, and requires much attention. The heavy and denſe woods give the greateſt heat, burn longeſt, and leave a denſe charcoal.

387. Dry turf gives a ſteady heat, and does not require ſo much attention as wood; but it conſumes faſt, its ſmoke is copious and penetrating, and the empyreumatic ſmell which it imparts to every thing it comes in contact with, adheres to them with great obſtinacy. The heavy turf of marſhes is preferable to the light ſuperficial turf.

388. Coal is the fuel moſt commonly uſed in this country. Its heat is conſiderable and ſufficiently permanent, but it produces much flame and ſmoke.

389. Charcoal, eſpecially of the denſe woods, is a very convenient and excellent fuel. It burns without flame or ſmoke, and gives a ſtrong, uniform, and permanent heat, which may be eaſily regulated, eſpecially when it is not in too large pieces, and is a little damp. But it is coſtly, and burns quickly.

390. Coke, or charred coal, poſſeſſes ſimilar properties to charcoal, it is leſs eaſily kindled, but is capable of producing a higher temperature, and burns more ſlowly.

391. When an open grate is uſed for chemical purpoſes, it ſhould be provided with cranes to ſupport the veſſels operated in, that they may not be overturned by the burning away of the fuel.

FURNACES.

392. In all furnaces, the principal objects are, to produce a fufficient degree of heat, with little confumption of fuel, and to be able to regulate the degree of heat.

393. An unneceffary expenditure of fuel is prevented by forming the fides of the furnace of very imperfect conductors of caloric, and by conftructing it fo that the fubject operated on may be expofed to the full action of the fire.

394. The degree of heat is regulated by the quantity of air which comes in contact with the burning fuel. The quantity of air is in the compound ratio of the fize of the aperture through which it enters and its velocity. The velocity is increafed by mechanical means, as by bellows, or by increafing the height and width of the chimney.

395. The fize and form of furnaces, and the materials of which they are conftructed are various, according to the purpofes for which they are intended.

396. The effential parts of a furnace are,

a. A body for the fuel to burn in.
b. A grate for it to burn upon.
c. An afh-pit to admit air and receive the afhes.
d. A chimney for carrying off the fmoke and vapours.

397. The afh-pit fhould be perfectly clofe, except the door, which fhould be furnifhed with a regifter-plate to regulate the quantity of air admitted.

398. The bars of the grate fhould be triangular, and placed with an angle pointed downwards, and not above half an inch diftant. The grate fhould be fixed on the outfide of the body.

399. The body may be cylindrical or eliptical, and it muft have apertures for introducing the fuel and the fubjects of the operation, and for conveying away the fmoke and vapours.

400. When the combuftion is fupported by the current of air naturally excited by the burning of the fuel, it is called a wind-furnace; when it is accelerated by increafing the velocity of the current by bellows, it forms a blaft-furnace; and when the body of the furnace is covered with a dome, which terminates in the chimney, it conftitutes a reverberatory furnace.

401. Furnaces are either fixed, and built of fire-brick, or portable, and fabricated of plate-iron. When of iron, they muft be lined with fome badly conducting and refractory fubftance, both to prevent the diffipation of heat, and to defend the iron againft the action of the fire. A mixture of fcales of iron and powdered tiles worked up with blood, hair, and clay, is much recommend-

ed; and Professor Hagen says, that it is less apt to split and crack when exposed at once to a violent heat, than when dried gradually, according to the common directions. Dr. Black employed two different coatings. Next to the iron he employed a composition of three parts by weight of charcoal, and one of fine clay. These are first mixed in the state of fine powder, and then worked up with as much water as will permit the mass to be formed into balls, which are applied to the sides of the furnace, and beat very firm and compact with the face of a broad hammar, to the thickness of about one inch and a half in general, but so as to give an eliptical form to the cavity. Over this, another lute, composed of six or seven parts of sand, and one of clay, is to be applied in the same manner, to the thickness of about half an inch. These lutes must be allowed to become perfectly dry before the furnace is heated, which should at first be done gradually. They may also be lined with fire bricks of a proper form, accurately fitted and well cemented together before the top plate is screwed on.

402. The general fault of furnaces is, that they admit too much air, which prevents us from regulating the temperature. It either becomes too violent and unmanageable, or when more cold air is admitted than what is necessary for supporting the combustion, it carries off heat, and prevents us from raising the temperature as high as we otherwise would. The superior merit of Dr. Black's furnace consists in the facility with which the admission of air is regulated; and every attempt hitherto made to improve it, by increasing the number of its apertures, have in reality injured it.

403. Heat may be applied to vessels employed in chemical operations,

a. Directly, as in the open fire and reverberatory furnace.
b. Or through the medium of sand; the sand-bath.
c. Of water; the water bath.
d. Of steam; the vapour-bath.
e. Of air, as in the muffle.

Chemical Operations.

404. In all chemical operations, combination takes place, and there are very few of them in which decomposition does not also occur. For the sake of method, we shall consider them as principally intended to produce

a. A change in the form of aggregation.
b. Combination.
c. Decomposition.

405. The form of aggregation may be altered by

a. Fuſion.
b. Vaporization.
c. Condenſation.
d. Congelation.
e. Coagulation.

406. *Liquefaction* is commonly employed to expreſs the melting of ſubſtances, as tallow, wax, reſin, &c. which paſs through intermediate ſtates of ſoftneſs before they become fluid. Fuſion is the melting of ſubſtances which paſs immediately from the ſolid to the fluid ſtate, as the ſalts and metals, except iron and platinum.

407. *Fuſion* is the converſion of a ſolid into a liquid by the ſole agency of caloric. Subſtances differ very much in the degrees of their fuſibility; ſome, as water and mercury, exiſting as fluids in the ordinary temperatures of the atmoſphere; while others, as the pure earths, cannot be melted by any heat we can produce.

408. When in conſequence of fuſion the ſubjects operated on acquire a greater or leſs degree of tranſparency, a denſe uniform texture, and great brittleneſs, and exhibit a conchoidal fracture, with a ſpecular ſurface, and the edges of the fragments very ſharp, it is termed *vitrification.*

409. In general, ſimple ſubſtances are leſs fuſible than compounds; for example, the ſimple earths cannot be melted ſingly, but when mixed, are eaſily fuſed. The additions which are ſometimes made to refractory ſubſtances to promote their fuſion, are termed *fluxes*.

410. Theſe fluxes are generally ſaline bodies.

a. The alkalies potaſs and ſoda, promote powerfully the fuſion of ſiliceous ſtones; but they are only uſed for accurate experiments. The *white flux* is a mixture of a little potaſs with carbonate of potaſs, and is prepared by deflagrating together equal parts of nitrate of potaſs and ſuper-tartrate of potaſs. When an oxide is at the ſame time to be reduced, the *black* flux is to be preferred, which is produced by the deflagration of two parts of ſuper-tartrate of potaſs, and one of nitrate of potaſs. It differs from the former only in containing a little charcoal. Soap promotes fuſion by being converted by the fire into carbonate of ſoda and charcoal.

b. Aluminous ſtones have their fuſion greatly promoted by the addition of ſub-borate of ſoda.

c. Muriate of ſoda, the mixed phoſphate of ſoda and ammonia, and other ſalts, are alſo occaſionally employed.

411. An open fire is ſufficient to melt ſome ſubſtances, others require the heat of a furnace.

412. The veſſels in which fuſion is performed, muſt reſiſt the heat neceſſary for the operation. In ſome inſtances, an iron or copper ladle or pot may be uſed, but moſt commonly crucibles are employed. Crucibles are of various ſizes. The large crucibles are generally conical, with a ſmall ſpout for the convenience of pouring out; the ſmall ones are truncated triangular pyramids, and are commonly ſold in neſts.

413. The Heſſian crucibles are compoſed of clay and ſand, and when good, will ſupport an intenſe heat for many hours, without ſoftening or melting; but they are diſpoſed to crack when ſuddenly heated or cooled. This inconvenience may be on many occaſions avoided, by uſing a double crucible, and filling up the interſtice with ſand, or by covering the crucible with a lute of clay and ſand, by which means the heat is tranſmitted more gradually and equally. Thoſe which ring clearly when ſtruck, and are of an uniform thickneſs, and have a reddiſh brown colour, without black ſpots, are reckoned the beſt.

414. Wedgewood's crucibles are made of clay mixed with baked clay finely pounded, and are in every reſpect ſuperior to the Heſſian, but they are very expenſive.

415. The black-lead crucibles, formed of clay and plumbago, are very durable, reſiſt ſudden changes of temperature, and may be repeatedly uſed, but they are deſtroyed when ſaline ſubſtances are melted in them, and ſuffer combuſtion when expoſed red-hot to a current of air.

416. When placed in a furnace, crucibles ſhould never be ſet upon the bars of the grate, but always upon a ſupport. Dr. Kennedy found the hotteſt part of a furnace to be about an inch above the grate. They may be covered, to prevent the fuel or aſhes from falling into them, with a lid of the ſame materials, or with another crucible inverted over them.

417. When the fuſion is completed, the ſubſtance may be either permitted to cool in the crucible, or may be poured into a heated mould anointed with tallow, never with oil, or what is ſtill better, covered with a thin coating of chalk, which is applied by laying it over with a mixture of chalk diffuſed in water, and then evaporating the water completely by heat. To prevent the crucible from being broken by cooling too rapidly, it is to be either replaced in the furnace, to cool gradually with it, or covered with ſome veſſel to prevent its being expoſed immediately to the air.

418. Fuſion is performed with the intentions,

a. Of weakening the attraction of aggregation.
1. To facilitate mechanical divifion.
2. To promote chemical action.

b. Of feparating from each other, fubftances of different degrees of fufibility.

419. *Vaporization* is the converfion of a folid or fluid into vapour by the agency of caloric. Although vaporability be merely a relative term, fubftances are faid to be permanently elaftic, volatile, or fixed. The permanently elaftic fluids or gafes are thofe which cannot be condenfed into a fluid or folid form by any abftraction of caloric we are capable of producing. Fixed fubftances, on the contrary, are thofe which cannot be converted into vapour by great increafe of temperature. The preffure of the atmofphere has very confiderable effect in varying the degree at which fubftances are converted into vapour. Some folids, unlefs fubjected to very great preffure, are at once converted into vapour, although moft of them pafs through the intermediate ftate of fluidity.

420. Vaporization is employed

a. To feparate fubftances differing in volatility.
b. To promote chemical action, by difaggregating them.

421. When employed with either of thefe views, either

a. No regard is paid to the fubftances volatilized,
1. From folids, as in uftulation and charring.
2. From fluids, as in evaporation.

b. Or the fubftances vaporized are condenfed in proper veffels,
1. In a liquid form, as in diftillation.
2. In a folid form, as in fublimation.

c. Or the fubftances vaporized are permanently elaftic, and are collected in their gafeous form, in a pneumatic apparatus.

422. *Uftulation* is almoft entirely a metallurgic operation, and is employed to expel the fulphur and arfenic contained in fome metallic ores. It is performed on fmall quantities in tefts placed within a muffle. Tefts are fhallow veffels made of bone afhes or baked clay. Muffles are veffels of baked clay, of a femi-cylindrical form, the flat fide forming the floor, and the arched portion the roof and fides. The end and fides are perforated with holes for

the free tranſmiſſion of the heated air, and the open extremity is placed at the door of the furnace, for the inſpection and manipulation of the proceſs. The reverberatory furnace is commonly employed for roaſting, and the heat is at firſt very gentle, and ſlowly raiſed to redneſs. It is accelerated by expoſing as large a ſurface of the ſubſtance to be roaſted as poſſible, and by ſtirring it frequently, ſo as to prevent any agglutination, and to bring every part in ſucceſſion to the ſurface.

423. *Charring* may be performed on any of the compound oxides, by ſubjecting them to a degree of heat ſufficient to expel all their hydrogen, nitrogen, and ſuperabundant oxygen, while the carbon, being a fixed principle, remains behind in the ſtate of charcoal. The temperature neceſſary for the operation may be produced either by the combuſtion of other ſubſtances, or by the partial combuſtion of the ſubſtance to be charred. In the former caſe, the operation may be performed in any veſſel which excludes the acceſs of air, while it permits the eſcape of the vapours formed. In the latter, the acceſs of air muſt be regulated in ſuch a manner, that it may be ſuppreſſed whenever the combuſtion has reached the requiſite degree; for if continued to be admitted, the charcoal itſelf would be diſſipated in the form of carbonic acid gas, and nothing would remain but the alkaline and earthy matter, which theſe ſubſtances always contain. When combuſtion is carried this length, the proceſs is termed *incineration*. The vapours which ariſe in the operation of charring, are ſometimes condenſed, as in the manufacture of tar.

424. *Evaporation* is the converſion of a fluid into vapour, by its combination with caloric. In this proceſs, the atmoſphere is not a neceſſary agent, but rather a hinderance, by its preſſure. This forms a criterion between evaporation and ſpontaneous evaporation, which is merely the ſolution of a fluid in air.

425. It is performed in open, ſhallow, or hemiſpherical veſſels of ſilver, tinned copper or iron, earthen-ware or glaſs. The neceſſary caloric may be furniſhed by means of an open fire, a lamp, or a furnace, either immediately, or with the intervention of ſand, water, or vapour. The degree of heat muſt be regulated by the nature of the ſubſtance operated on. In general, it ſhould not be greater than what is abſolutely neceſſary.

426. Evaporation may be,

a. Partial.

1. From ſaline fluids, concentration.
2. From viſcid fluids, inſpiſſation.

b. Total, exſiccation.

427. *Concentration* is employed,

a. To leſſen the quantity of diluting fluids, deflegmation.
b. As a preliminary ſtep to cryſtallization.

428. *Inſpiſſation* is almoſt confined to animal and vegetable ſubſtances; and as theſe are apt to be partially decompoſed by heat, or to become empyreumatic, it ſhould always be performed, eſpecially towards the end of the proceſs, in a water or vapour bath.

429. *Exſiccation* is here taken in a very limited ſenſe; for the term is alſo with propriety uſed to expreſs the drying of vegetables by a gentle heat, the efflorеſcence of ſalts, and the abſtraction of moiſture from mixtures of inſoluble powders with water, by means of chalk-ſtones or powdered chalk preſſed into a ſmooth maſs. At preſent, we limit its meaning to the total expulſion of moiſture from any body by means of caloric.

430. The exſiccation of compound oxides ſhould always be performed in the water bath.

431. Salts are deprived of their water of cryſtallization by expoſing them to the action of heat in a glaſs veſſel or iron ladle. Sometimes they firſt diſſolve in their water of cryſtallization, or undergo what is called the *watery fuſion*, and are afterwards converted into a dry maſs by its total expulſion; as in the calcination of borax or burning of alum.

432. When exſiccation is attended with a crackling noiſe, and ſplitting of the ſalt, as in muriate of ſoda, it is termed *decrepitation*, and is performed by throwing into a heated iron veſſel, ſmall quantities of the ſalt at a time, covering it up, and waiting until the decrepitation be over, before a freſh quantity is thrown in.

433. Exſiccation is performed on ſaline bodies, to render them more acrid or pulverulent, or to prepare them for chemical operations. Animal and vegetable ſubſtances are exſiccated to give them a ſolid form, and to prevent their fermentation.

434. *Condenſation* is the reverſe of expanſion, and is produced either,

a. By mechanical preſſure forcing out the caloric in a ſenſible form, as water is ſqueezed out of a ſponge, or,
b. By the chemical abſtraction of caloric, which is followed by an approximation of the particles of the ſubſtance.

435. The latter ſpecies of condenſation only is the object of our inveſtigation at preſent. In this way we may be ſuppoſed to condenſe,

a. Subſtances exiſting naturally as gaſes, or vapours.

b. Subſtances, naturally ſolid or fluid, converted into vapours by adventitious circumſtances.

436. The former inſtance is almoſt ſuppoſitious; for, except the oxygenized muriatic acid gas, we are not able, by any diminution of temperature, to reduce the permanently elaſtic fluids, to a fluid or ſolid ſtate.

437. The latter inſtance is always preceded by vaporization, and comprehends thoſe operations in which the ſubſtances vaporiſed are condenſed in proper veſſels. When the product is a fluid, it is termed diſtillation; when ſolid, ſublimation.

438. *Diſtillation* is ſaid to be performed,

a. Viâ humidâ, when fluids are the ſubjects of the operation.

b. Viâ ſiccâ, when ſolids are ſubjected to the operation, and the fluid product ariſes from decompoſition, and a new arrangement of the conſtituent principles.

439. The objects of diſtillation are,

a. To ſeparate more volatile fluids from leſs volatile fluids or ſolids.

b. To promote the union of different ſubſtances.

c. To generate new products by the action of fire.

440. In all diſtillations, the heat applied ſhould not be greater than what is neceſſary for the formation of the vapour, and even to this degree it ſhould be gradually raiſed. The veſſels alſo in which the diſtillation is performed, ſhould never be filled above one-half, and ſometimes not above one-fourth, leſt the ſubſtance contained in them ſhould boil over.

441. As diſtillation is a combination of evaporation and condenſation, the apparatus conſiſts of two principal parts:

a. The veſſels in which the vapours are formed.

b. The veſſels in which they are condenſed.

442. The veſſels employed for both purpoſes are very various in their ſhapes, according to the manner in which the operation is conducted. The firſt difference depends on the direction of the vapour after its formation. It either,

a. Deſcends; diſtillation *per deſcenſum.*

b. Aſcends; diſtillation *per aſcenſum.*

c. Or paſſes off by the ſide; diſtillation *per latus.*

443. In the diſtillation *per deſcenſum*, a perforated plate of tinned iron, or other materials, is fixed within any convenient veſſel, ſo as to leave a ſpace beneath it. On this the ſubject of the operation is laid, and over it is placed another plate, accurately cloſing the mouth of the veſſel, and ſufficiently ſtrong to ſupport the fuel. Thus the heat is applied from above, and the vapour is forced to deſcend into the inferior cavity, where it is condenſed. In this way the oil of cloves is prepared, and on the ſame principles tar is manufactured, and mercury and zinc are ſeparated from their ores.

444. In the diſtillation *per aſcenſum*, the vapour is allowed to ariſe to ſome height, and then is conveyed away to be condenſed. The veſſel moſt commonly employed for this purpoſe is the common copper ſtill, which conſiſts of a body for containing the materials, and a head into which the vapour aſcends. From the middle of the head a tube riſes for a ſhort way, and is then reflected downwards, through which the ſteam paſſes to be condenſed. Another kind of head, riſing to a great height before it is reflected, is ſometimes uſed for ſeparating fluids, which differ little in volatility, as it was ſuppoſed that the leſs volatile vapours would be condenſed and fall back into the ſtill, while only the more volatile vapours would ariſe to the top, ſo as to paſs to the refrigeratory. The ſame object may be more conveniently attained by managing the fire with caution and addreſs. The greater the ſurface expoſed, and the leſs the height the vapours have to aſcend, the more rapidly does the diſtillation proceed; and ſo well are theſe principles underſtood by the Scotch diſtillers, that they do not take more than three minutes to diſcharge a ſtill containing 50 gallons of fluid.

445. The condenſing apparatus uſed with the common ſtill is very ſimple. The tube in which the head terminates, is inſerted into the upper end of a pipe, which is kept cool by paſſing through a veſſel filled with water, called the Refrigeratory. This pipe is commonly made of a ſerpentine form; but as this renders it difficult to be cleaned, Dr. Black recommends a ſigmoid pipe. The refrigeratory may be furniſhed with a ſtop-cock, that when the water it contains becomes too hot, and does not condenſe all the vapour produced, it may be changed for cold water. From the lower end of the pipe, the product of the diſtillation drops into the veſſel deſtined to receive it; and we may obſerve, that when any vapour iſſues along with it, we ſhould either diminiſh the power of the fire, or change the water in the refrigeratory.

446. *Circulation* was a proceſs formerly in uſe. It conſiſted in arranging the apparatus, ſo that the vapours were no ſooner condenſed into a fluid form, than this fluid returned back into the diſtilling veſſels, to be again vaporized; and was effected by diſtil-

ling in a glaſs veſſel, with ſo long a neck that the vapours were condenſed before they eſcaped at the upper extremity, or by inverting one matraſs within another.

447. When corroſive ſubſtances are diſtilled in this way, the cucurbit and alembic are uſed; but theſe ſubſtances are more conveniently diſtilled *per latus*.

448. The diſtillation *per latus* is performed in a retort, or pear-ſhaped veſſel, having the neck bent to one ſide. The body of a good retort is well rounded, uniform in its appearance, and of an equal thickneſs, and the neck is ſufficiently bent to allow the vapours, when condenſed, to run freely away, but not ſo much as to render the application of the receiver inconvenient, or to bring it too near the furnace. The paſſage from the body into the neck muſt be perfectly free and ſufficiently wide, otherwiſe the vapours produced in the retort only circulate in its body, without paſſing over into the receiver. For introducing liquors into the retort without ſoiling its neck, which would injure the product, a bent funnel is neceſſary. It muſt be ſufficiently long to introduce the liquor directly into the body of the retort; and in withdrawing it, we muſt carefully keep it applied to the upper part of the retort, that the drop hanging from it may not touch the inſide of the neck. In ſome caſes, where a mixture of different ſubſtances is to be diſtilled, it is convenient and neceſſary to have the whole apparatus properly adjuſted before the mixture is made, and we muſt therefore employ a tubulated retort, or a retort furniſhed with an aperture, accurately cloſed with a ground ſtopper.

449. The tubulature ſhould be placed on the upper convex part of the retort before it bends to form the neck, ſo that a fluid poured through it may fall directly into the body without ſoiling the neck.

450. Retorts are made of various materials. Flint-glaſs is commonly uſed when the heat is not ſo great as to melt it. For diſtillations which require exceſſive degrees of heat, retorts of earthen-ware, or coated (376. *d.*) glaſs retorts are employed. Quickſilver is diſtilled in iron retorts.

451. The ſimpleſt condenſing apparatus uſed with the retort, is the common glaſs receiver; which is a veſſel of a conical or globular form, having a neck ſufficiently wide to admit of the neck of the retort being introduced within it. To prevent the loſs and diſſipation of the vapours to be condenſed, the retort and receiver may be accurately ground to each other, or ſecured by ſome proper lute. To prevent the receiver from being heated by the caloric evolved during the condenſation of vapours in it, we muſt employ ſome means to keep it cool. It is either immerſed in cold water, or covered with ſnow, or pounded ice, or a conſtant evaporation is ſupported from its ſurface, by covering it with a cloth, which is

kept moiſt by means of the deſcent of water, from a veſſel placed above it, through minute ſyphons or ſpongy worſted threads. But as, during the proceſs of diſtillation, permanently elaſtic fluids are often produced, which would endanger the breaking of the veſſels, theſe are permitted to eſcape either through a tubulature, or hole in the ſide of the receiver, or rather through a hole made in the luting (380.) Receivers having a ſpout iſſuing from their ſide, are uſed when we wiſh to keep ſeparate the products obtained at different periods of any diſtillation. For condenſing very volatile vapours, a ſeries of receivers, communicating with each other, termed Adopters, were formerly uſed; but theſe are now entirely ſuperſeded by Woulfe's apparatus.

452. This apparatus conſiſts of a tubulated retort, adapted to a tubulated receiver. With the tubulature of the receiver, a three-necked bottle is connected by means of a bent tube, the further extremity of which is immerſed, one or more inches, in ſome fluid contained in the bottle. A ſeries of two or three ſimilar bottles are connected with this firſt bottle in the ſame way. In the middle tubulature of each bottle, a glaſs tube is fixed, having its lower extremity immerſed about a quarter of an inch in the fluid. The height of the tube above the ſurface of the fluid muſt be greater than the ſum of the columns of fluid ſtanding over the further extremities of the connecting tubes, in all the bottles or veſſels more remote from the retort. Tubes ſo adjuſted are termed Tubes of Safety, for they prevent that reflux of fluid from the more remote into the nearer bottles, and into the receiver itſelf, which would otherwiſe inevitably happen, on any condenſation of vapour taking place in the retort, receiver, or nearer bottles. Different contrivances for the ſame purpoſe have been deſcribed by Meſſrs Welter and Burkitt; and a very ingenious mode of connecting the veſſels without lute, has been invented by Citizen Girard, but they would not be eaſily underſtood without plates. The further tubulature of the laſt bottle is commonly connected with a pneumatic apparatus, by means of a bent tube. When the whole is properly adjuſted, air blown into the retort ſhould paſs through the receiver, riſe in bubbles through the fluids contained in each of the bottles, and at laſt eſcape by the bent tube. In the receiver, thoſe products of diſtillation are collected, which are condenſable by cold alone. The firſt bottle is commonly filled with water, and the others with alkaline ſolutions, or other active fluids; and as the permanently elaſtic fluids produced, are ſucceſſively ſubjected to the action of all of theſe, only thoſe gaſes will eſcape by the bent tube which are not abſorbable by any of them.

Pneumatic Apparatus.

453. The great importance of the elaſtic fluids in modern chemiſtry, has rendered an acquaintance with the means of collecting and preſerving them indiſpenſable.

454. When a gas is produced by any means, it may be received either,

a. Into veſſels abſolutely empty; or,
b. Into veſſels, filled with ſome fluid, on which it exerts no action.

455. The firſt mode (425. *a.*) of collecting gaſes, may be practiſed by means of a bladder, moiſtened ſufficiently to make it perfectly pliable, and then compreſſed ſo as to preſs out every particle of air from its cavity. In this ſtate it may be eaſily filled with any gas. An oiled ſilk bag will anſwer the ſame purpoſe, and is more convenient in ſome reſpects, as it may be made of any ſize or form.

456. Glaſs or metallic veſſels, ſuch as balloons, may alſo be emptied for the purpoſe of receiving gaſes, by fitting them with a ſtop-cock, and exhauſting the air from them by means of an air-pump.

457. But the ſecond mode (425. *b.*) of collecting gaſes is the moſt coſt convenient and common.

458. The veſſels may be filled either,

a. With a fluid lighter; or,
b. Heavier than the gas to be received into it.

459. The former method is ſeldom employed; but if we conduct a ſtream of any gas heavier than atmoſpheric air, ſuch as carbonic acid gas, muriatic acid gas, &c. to the bottom of any veſſel, it will gradually diſplace the air, and fill the veſſel.

460. On the contrary, a gaſs lighter than atmoſpheric air, ſuch as hydrogen, may be collected in an inverted veſſel by conducting a ſtream of it to the top.

461. But gaſes are moſt commonly collected by conducting the ſtream of gaſs into an inverted glaſs-jar, or any other veſſel filled with water or mercury. The gas aſcends to the upper part of the veſſel, and diſplaces the fluid. In this way gas may be kept a very long time, provided a ſmall quantity of the fluid be left in the veſſels, which prevents both the eſcape of the gas, and the admiſſion of atmoſpheric air.

462. The veſſels may be of various ſhapes; but the moſt com-

monly employed are cylindrical. They may be either open only at one extremity, or furniſhed at the other with a ſtop-cock.

463. The manner of filling theſe veſſels with fluid, is to immerſe them completely in it, with the open extremity directed a little upwards, ſo that the whole air may eſcape from them, and then inverting them with their mouths downwards.

464. For filling them with convenience, a trough or ciſtern is commonly uſed. This either ſhould be hollowed out of a ſolid block of wood or marble; or, if it be conſtructed of wood ſimply, it muſt be well painted, or lined with lead or tinned copper. Its ſize may vary very much; but it muſt contain a ſufficient depth of fluid to cover the largeſt tranſverſe diameter of the veſſels to be filled in it. At one end or ſide, there ſhould be a ſhelf for holding the veſſels after they are filled. This ſhelf ſhould be placed about an inch and a half below the ſurface of the fluid, and ſhould be perforated with ſeveral holes, forming the apices of correſponding conical excavations on the lower ſide, through which, as through inverted funnels, gaſeous fluids may be more eaſily introduced into the veſſels placed over them.

465. In general, the veſſels uſed with a mercurial apparatus ſhould be ſtronger and ſmaller than thoſe for a water-ciſtern, and we muſt have a variety of glaſs and elaſtic tubes for conveying the gaſes from the veſſels in which they are formed to the funnels under the ſhelf.

466. *Rectification* is the repeated diſtillation of any fluid. When diſtillation renders the fluid ſtronger, or abſtracts water from it, it is termed *Dephlegmation*. When a fluid is diſtilled off from any ſubſtance, it is called *Abſtraction;* and if the product be rediſtilled from the ſame ſubſtance, or a freſh quantity of the ſame ſubſtance, it is denominated *Cohobation*.

467. *Sublimation* differs from diſtillation only in the form of the product. When it is compact, it is termed a Sublimate; when looſe and ſpongy, it formerly had the improper appellation of Flowers. Sublimation is ſometimes performed in a crucible, and the vapours are condenſed in a paper cone, or in another crucible inverted over it; ſometimes in the lower part of a glaſs flaſk, cucurbit or phial, and the condenſation is effected in the upper part or capital, and ſometimes in a retort with a very ſhort and wide neck, to which a conical receiver is fitted. The heat is moſt commonly applied through the medium of a ſand-bath; and the degree of heat, and the depth to which the veſſel is inſerted in it, are regulated by the nature of the ſublimation.

468. *Congelation* is the reduction of a fluid to a ſolid form, in conſequence of the abſtraction of caloric. The means employed for abſtracting caloric are the evaporation of volatile fluids, the ſolution of ſolids, and the contact of cold bodies.

469. *Coagulation* is the converſion of a fluid into a ſolid of greater or leſs conſiſtence, merely in conſequence of a new arrangement of its particles, as during the proceſs there is no ſeparation of caloric or any other ſubſtance. The means of producing coagulation, are increaſe of temperature, and the addition of certain ſubſtances, as acids and runnets.

Combination.

470. Chemical combination is the intimate union of the particles of at leaſt two heterogeneous bodies. It is the effect reſulting from the exertion of the attraction of affinity, and is therefore ſubjected to all the laws of affinity.

471. To produce the chemical union of any bodies, it is neceſſary,

1. That they poſſeſs affinity for each other.
2. That their particles come into actual contact.
3. That the ſtrength of the affinity be greater than any counteracting cauſes which may be preſent.

472. The principal counteracting cauſes are,

1. The attraction of aggregation.
2. Affinities for other ſubſtances.

473. The means to be employed for overcoming the action of other affinities will be treated of under Decompoſition.

474. The attraction of aggregation is overcome by means of

1. Mechanical diviſion.
2. The action of caloric.

475. Combination is facilitated by increaſing the points of actual contact,

1. By mechanical agitation.
2. By condenſation; compreſſion.

476. The proceſſes employed for producing combination, may be conſidered,

1. With regard to the nature of the ſubſtances combined; and,
2. To the nature of the compound produced.

Gases,

1. Combine with gases;
2. And dissolve fluids or solids;
3. Or are absorbed by them.

Fluids,

1. Are dissolved in gases;
2. Or absorb them.
3. Combine with fluids,
4. And dissolve solids;
5. Or are rendered solid by them.

Solids,

1. Are dissolved in fluids and in gases; or
2. Absorb gases,
3. And solidify fluids.

477. The combination of gases with each other, in some instances, takes place when simply mixed together: thus nitrous and oxygen gases combine as soon as they come into contact; in other instances, it is necessary to elevate their temperature to a degree sufficient for their inflammation, either by means of the electric spark, or the contact of an ignited body, as in the combination of oxygen gas with hydrogen or nitrogen gas.

478. When gases combine with each other, there is always a considerable diminution of bulk, and not unfrequently they are condensed into a liquid or solid form. Hydrogen and oxygen gases form water; muriatic acid and ammonia gases form solid muriate of ammonia. But when the combination is effected by ignition, a violent expansion, which endangers the bursting of the vessels, previously takes place, in consequence of the increase of temperature.

479. *Solution* is the diminution of aggregation in any solid or fluid substance, in consequence of its entering into chemical combination. The substance, whether solid or fluid, whose aggregation is lessened, is termed the Solvend; and the substance, by whose agency the solution is effected, is often called the Menstruum or Solvent.

480. Solution is said to be performed *viâ humidâ*, when the natural form of the solvent is fluid; but when the agency of heat is necessary to give the solvent its fluid form, the solution is said to be performed *viâ siccâ*.

481. The diſſolving power of each menſtruum is limited, and is determinate with regard to each ſolvend. The ſolubility of bodies is alſo limited and determinate with regard to each menſtruum.

482. When any menſtruum has diſſolved the greateſt poſſible quantity of any ſolvend, it is ſaid to be ſaturated with it. But, in ſome caſes, although ſaturated with one ſubſtance, it is ſtill capable of diſſolving others. Thus a ſaturated ſolution of muriate of ſoda will diſſolve a certain quantity of nitrate of potaſs, and after that a portion of muriate of ammonia.

483. The diſſolving power of ſolvents, and conſequently the ſolubility of ſolvends, are generally increaſed by increaſe of temperature: and converſely, this power is diminiſhed by diminution of temperature; ſo that, from a ſaturated ſolution, a ſeparation of a portion of the ſolvend generally takes place on any reduction of temperature. This property becomes extremely uſeful in many chemical operations, eſpecially in cryſtallization.

484. Particular terms have been applied to particular caſes of ſolution.

485. The ſolution of a fluid in the atmoſphere is termed *ſpontaneous evaporation*. It is promoted by expoſing a large ſurface, by frequently renewing the air in contact with the ſurface, and by increaſe of temperature.

486. Some ſolids have ſo ſtrong an affinity for water, that they attract it from the atmoſphere in ſufficient quantity to diſſolve them. Theſe are ſaid to *deliqueſce*. Others, on the contrary, retain their water of cryſtallization with ſo weak a force, that the atmoſphere attracts it from them, ſo that they crumble into powder. Theſe are ſaid to *effloreſce*. Both operations are promoted by expoſing large ſurfaces, and by a current of air; but the latter is facilitated by a warm dry air, and the former by a cold humid atmoſphere.

487. Solution is alſo employed to ſeparate ſubſtances, (for example, ſaline bodies), which are ſoluble in the menſtruum, from others which are not. When our object is to obtain the ſoluble ſubſtance in a ſtate of purity, the operation is termed *lixiviation*, and as ſmall a quantity of the menſtruum as is poſſible is uſed. When, however, it is employed to free an inſoluble ſubſtance from ſoluble impurities, it is termed *edulcoration*, which is beſt performed by uſing a very large quantity of the menſtruum.

488. Organic products being generally compoſed of heterogeneous ſubſtances, are only partially ſoluble in the different menſtrua. To the ſolution of any of theſe ſubſtances, while the others remain undiſſolved, the term *extraction* is applied; and when, by evaporation, the ſubſtance extracted is reduced to a ſolid form, it is termed an Extract, which is hard or ſoft, watery or ſpiritous,

according to the degree of consistency it acquires, and the nature of the menstruum employed.

489. *Infusion* is employed to extract the virtues of aromatic and volatile substances, which would be dissipated by decoction, and destroyed by maceration, and to separate substances of easy solution from others which are less soluble. The process consists in pouring upon the substance to be infused, placed in a proper vessel, the menstruum, either hot or cold, according to the direction, covering it up, agitating it frequently, and after a due time, straining or decanting off the liquor, which is now termed the Infusion.

490. *Maceration* differs from infusion, in being continued for a longer time, and can only be employed for substances which do not easily ferment or spoil.

491. *Digestion*, on the other hand, differs from maceration only in the activity of the menstruum being promoted by a gentle degree of heat. It is commonly performed in a glass matrass, which should only be filled one third, and covered with a piece of wet bladder, pierced with one or more small holes, so that the evaporation of the menstruum may be prevented as much as possible, without risk of bursting the vessel. The vessel may be heated, either by means of the sun's rays, of a common fire, or of the sand-bath; and when the last is employed, the vessel should not be sunk deeper in the sand than the portion that is filled. Sometimes when the menstruum employed is valuable, a distilling apparatus is used to prevent any waste of it. At other times, a blind capital is luted on the matrass, or a smaller matrass is inverted within a larger one; and as the vapour which arises is condensed in it, and runs back into the larger, the process in this form has got the name of *Circulation*.

492. *Decoction* is performed by subjecting the substances operated on to a degree of heat which is sufficient to convert the menstruum into vapour, and can only be employed with advantage for extracting principles which are not volatile, and from substances whose texture is so dense and compact as to resist the less active methods of solution. When the menstruum is valuable, that portion of it which is converted into vapour, is generally saved by condensing it in a distilling apparatus, (441.)

493. Solutions in alcohol are termed Tinctures, and in vinegar or wine, Medicated vinegars or wines. The solution of metals in mercury is termed Amalgamation. The combinations of other metals with each other form Alloys.

494. *Absorption* is the condensation of a gas into a fluid or solid form, in consequence of its combination with a fluid or solid. It is facilitated by increase of surface and agitation; and the power of absorption in fluids is much increased by compression and di-

minution of temperature, although in every inſtance it be limited and determinate. Dr. Nooth invented an ingenious apparatus for combining gaſes with fluids, and Meſſrs. Schweppe, Henry, Paul, and Cuthbertſon, have very advantageouſly employed compreſſion.

495. Fluids often become ſolid by entering into combination with ſolids, and this change is always accompanied by conſiderable increaſe of temperature, as in the ſlaking of lime.

Decomposition.

496. *Decompoſition* is the ſeparation of bodies which were chemically combined.

497. It can only be effected by the agency of ſubſtances poſſeſſing a ſtronger affinity for one or more of the conſtituents of the compound, than theſe poſſeſs for each other.

498. Decompoſition has acquired various appellations, according to the phenomena which accompany it.

499. *Diſſolution* differs from ſolution in being accompanied by the decompoſition, or a change in the nature of the ſubſtance diſſolved. Thus, we correctly ſay, a ſolution of lime in muriatic acid, and a diſſolution of chalk in muriatic acid.

500. Sometimes a gas is ſeparated during the action of bodies on each other. When this eſcapes with conſiderable violence and agitation of the fluid, it is termed *efferveſcence*. The gas is very frequently allowed to eſcape into the atmoſphere, but at other times is either collected in a pneumatic apparatus, or made to enter into ſome new combination. The veſſels in which an efferveſcing mixture is made, ſhould be high and ſufficiently large, to prevent any loſs of the materials from their running over, and in ſome caſes the mixture muſt be made ſlowly and gradually.

501. *Precipitation* is the reverſe of ſolution. It comprehends all thoſe proceſſes in which a ſolid is obtained by the decompoſition of a ſolution. The ſubſtance ſeparated is termed a Precipitate, if it ſink to the bottom of the fluid; or a Cream, if it ſwim above it. Precipitation, like ſolution, is performed either *viâ humidâ*, or *viâ ſiccâ*, (479.)

502. The objects of precipitation are,

1. The ſeparation of ſubſtances from ſolutions in which they are contained.
2. The purification of ſolutions from precipitable impurities.
3. The formation of new combinations.

503. Precipitation is effected,

1. By leſſening the quantity of the ſolvent by evaporation.

2. By diminiſhing its ſolvent power, as by reduction of temperature, or dilution,
3. Or by the addition of ſome chemical agent, which from its more powerful affinities,
   a. Either combines with the ſolvent, and precipitates the ſolvend;
   b. Or forms itſelf an inſoluble compound with ſome conſtituent of the ſolution.

504. The two firſt means of precipitation have been already noticed. Indeed they are rarely conſidered as inſtances of precipitation, as the effect is gradual, and the precipitated matter moſt commonly aſſumes determinate figures.

505. In performing it in the laſt manner, we may obſerve the following rules:

1. The ſolution and precipitant muſt poſſeſs the requiſite degree of purity.
2. The ſolution ſhould be perfectly ſaturated, to avoid unneceſſary expenditure of the ſolvent or precipitant
3. The one is to be added ſlowly and gradually to the other.
4. After each addition, they are to be thoroughly mixed by agitation.
5. We muſt allow the mixture to ſettle, after we think that enough of the precipitant has been added, and try a little of the clear ſolution, by adding to it ſome of the precipitant; if any precipitation takes place, we have not added enough of the precipitant. This is neceſſary, not only to avoid loſs, but in many inſtances, the precipitant, if added in exceſs, re-diſſolves or combines with the precipitate.

506. After the precipitation is completed, the precipitate is to be ſeparated from the ſupernatant fluid by ſome of the means already noticed.

507. When the precipitate is the chief object of our proceſs, and when it is not ſoluble in water, it is often adviſable to dilute, to a conſiderable degree, both the ſolution and precipitant, before performing the operation. When it is only difficultly ſoluble, we muſt content ourſelves with waſhing the precipitate, after it is ſeparated by filtration. In ſome caſes the ſeparation of the precipitate is much aſſiſted by a gentle heat.

508. *Cryſtallization* is a ſpecies of precipitation, in which the particles of the ſolvend, on ſeparating from the ſolution, aſſume certain determinate forms.

509. The conditions neceſſary for cryſtallization are,

1. That the integrant particles have a tendency to arrange themſelves in a determinate manner, when acted on by the attraction of aggregation.
2. That they be diſaggregated, at leaſt ſo far as to poſſeſs ſufficient mobility to aſſume their peculiar arrangement.
3. That the cauſes diſaggregating them be ſlowly and gradually removed.

510. Notwithſtanding the immenſe variety in the forms of cryſtals, M. Hauy has rendered it probable, that there are only three forms of the integrant particles:

1. The parallelopiped.
2. The triangular priſm.
3. The tetrahedron.

511. But as theſe particles may unite in different ways, either by their faces or edges, they will compoſe cryſtals of various forms.

512. The primitive forms have been reduced to ſix:

1. The parallelopiped.
2. The regular tetrahedron.
3. The octahedron with triangular faces.
4. The ſix-ſided priſm.
5. The dodecahedron terminated by rhombs.
6. The dodecahedron with iſoſceles triangular faces.

513. Almoſt all ſubſtances, on cryſtallizing, retain a portion of water combined with them, which is eſſential to their exiſtence as cryſtals, and is therefore denominated Water of cryſtallization. Its quantity varies very much in different cryſtallized ſubſtances.

514. The means by which the particles of bodies are diſaggregated, ſo as to admit of cryſtallization, are ſolution, fuſion, vaporization, or mechanical diviſion and ſuſpenſion in a fluid medium.

515. The means by which the diſaggregating cauſes are removed, are, evaporation, reduction of temperature, and reſt.

516. When bodies are merely ſuſpended in a ſtate of extreme mechanical diviſion, nothing but reſt is neceſſary for their cryſtallization.

517. When they are diſaggregated by fuſion or vaporization, the regularity of their cryſtals depends on the ſlowneſs with which their temperature is reduced; for if cooled too quickly, their particles have not time to arrange themſelves, and are converted at once into a confuſed or unvaried ſolid maſs. Thus glaſs, which,

when cooled quickly, is ſo perfectly uniform in its appearance, when cooled ſlowly, has a cryſtalline texture. But in order to obtain cryſtals by means of fuſion, it is often neceſſary, after the ſubſtance has begun to cryſtallize, to remove the part which remains fluid, for otherwiſe it would fill up the interſtices among the cryſtals firſt formed, and give the whole the appearance of one ſolid maſs. Thus, after a cruſt has formed on the top of melted ſulphur, by pouring off the ſtill fluid part, we obtain regular cryſtals.

518. The means by which bodies, which have been diſaggregated by ſolution, are made to cryſtallize moſt regularly, vary according to the habitudes of the bodies with their ſolvents and caloric.

519. Some ſaline ſubſtances are much more ſoluble in hot than in cold water; therefore, a boiling ſaturated ſolution of any of theſe will depoſite, on cooling, the exceſs of ſalt, which it is unable to diſſolve when cold. Theſe ſalts commonly contain much water of cryſtallization.

520. Other ſalts are ſcarcely, if at all, more ſoluble in hot than in cold water; and therefore their ſolutions muſt be evaporated, either by heat, or ſpontaneouſly. Theſe ſalts commonly contain little water of cryſtallization.

521. The beauty and ſize of the cryſtals depend upon the purity of the ſolution, its quantity, and the mode of conducting the evaporation and cooling.

522. When the ſalt is not more ſoluble in hot than in cold water, by means of gentle evaporation a ſucceſſion of pellicles are formed on the top of the ſolution, which either are removed, or permitted to ſink to the bottom by their own weight; and the evaporation is continued until the cryſtallization be completed.

523. But when the ſalt is capable of cryſtallizing on cooling, the evaporation is only continued until a drop of the ſolution, placed upon ſome cold body, ſhews a diſpoſition to cryſtallize, or at fartheſt only until the firſt appearance of a pellicle. The ſolution is then covered up, and ſet aſide to cool, and the more ſlowly it cools, the more regular are the cryſtals. The mother-water, or ſolution which remains after the cryſtals are formed, may be repeatedly treated in the ſame way as long as it is capable of furniſhing any more ſalt.

524. When very large and beautiful cryſtals are wanted, they may be obtained by laying well-formed cryſtals in a ſaturated ſolution of the ſame ſalt, and turning them every day. In this way their ſize may be conſiderably increaſed, though not without limitation, for after a certain time they grow ſmaller inſtead of larger.

525. Cryſtallization is employed,

1. To obtain cryſtallizable ſubſtances in a ſtate of purity.
2. To ſeparate them from each other, by taking advantage of their different ſolubility at different temperatures.

Oxygenizement.

526. The combination of oxygen is the object of many chemical and pharmaceutical proceſſes.

527. With regard to the manner of combination, the oxygenizement may take place either

a. Without the production of heat and light, to expreſs which there is no other than the generic term *oxygenizement*; or

b. With the production of heat and light, *combuſtion.*

1. In ſubſtances which remain fixed at the temperature neceſſary for their combuſtion, there is no other more ſpecific term.
2. In ſubſtances which exiſt as gaſes, or are previouſly reduced to the ſtate of vapour by the temperature neceſſary, it is termed *inflammation*; and if it proceed with very great violence and rapidity, *deflagration.*

528. Combuſtion and inflammation have been already deſcribed.

529. *Deflagration*, from its violence, muſt always be performed with caution. The common mode of conducting this proceſs is, to introduce the ſubſtances to be deflagrated together into any convenient veſſel, commonly an iron pot, or crucible, heated to redneſs. But to obviate any inconvenience, and to enſure the ſucceſs of the proceſs, they are previouſly made perfectly dry, reduced to powder, and thorougly mixed together, and they are deflagrated gradually, for example, by ſpoonfuls; but we muſt take care always to examine the ſpoon, leſt a ſpark ſhould adhere to it, which might ſet fire to the whole maſs. During the proceſs, the portion introduced ſhould be frequently ſtirred.

530. The oxygen neceſſary for the proceſſes may be derived from the decompoſition

a. Of oxygen gas, or atmoſpheric air.

b. Of oxides, particularly water.

c. Of acids and their combinations, eſpecially the oxygenized muriatic and nitric acids.

531. The different modes of oxygenizement are intended either

a. To produce heat and light.
b. To obtain an oxygenized product:
1. An oxide, when the procefs may be termed *Oxidizement.*
2. An acid, *Acidification.*
c. To remove an oxygenizable fubftance.

532. Hydrogen, carbon, and nitrogen, are never, unlefs for experiment, oxygenized as fimple fubftances.

533. Sulphur is converted into fulphuric acid by burning it in leaden chambers, or by deflagrating it with nitrate of potafs; and phofphorus is acidified by inflammation in the atmofphere.

534. Of all the fimple oxygenizable fubftances, the metals are moft frequently combined with oxygen; and as in confequence of this combination they lofe their metallic appearance, they were formerly faid to be calcined or corroded.

535. Metals differ very much in the facility with which they are oxygenized by the contact of oxygen gas. For fome, as iron and manganefe, the ordinary temperature of the atmofphere is fufficient; others, as gold and platinum, fcarcely undergo any change in the moft violent heat. The operation is performed by heating them to the requifite temperature, and expofing them to the action of the air; and on the fufible metals it is promoted by ftirring them when melted.

536. Metals alfo differ in the mode of their action upon water. They are either capable of decompofing water,

a. At ordinary temperatures, as iron, zinc, manganefe, &c.
b. At elevated temperatures, as antimony and tin; or,
c. When acted upon at the fame time by an acid or an alkali, as copper, lead, bifmuth; or, laftly,
d. They are incapable of decompofing it, as gold, filver, mercury, platinum.

537. The oxygenizement of metals by water is promoted by the action of air. Iron, for example, is more quickly rufted by being merely moiftened with water, than when totally immerfed in water.

533. But the acids are the moft powerful agents in oxygenizing metals. They do it in two ways, either

1. By enabling them to decompofe water.
2. By being decompofed themfelves.

539. Sulphuric acid is decompoſed by very few metals, unleſs aſſiſted by conſiderable increaſe of temperature; but it powerfully promotes the decompoſition of water.

540. Nitric acid is decompoſed by many of them with very great violence, proceeding in ſome inſtances even to inflammation. It alſo oxygenizes them to the higheſt degree of which they are ſuſceptible. It ſeldom produces the decompoſition of water.

541. Muriatic acid is never decompoſed, and only acts on thoſe metals capable of decompoſing water.

542. Oxygenized muriatic acid reſembles the nitric, both in the violence of its action, and in the extent to which it carries the oxygenizement of the metals.

543. The metals are ſuſceptible of different degrees of oxygenizement, ſome of them even of acidification, and, in general, they are more oxygenized according to the rapidity of the proceſs. When proceeding too ſlowly, it may be accelerated by heat; when too violent, it muſt be checked by diminution of temperature, as by plunging the veſſel in which the operation is performing into cold water.

544. When the degree of oxygenizement is not very great, the oxide formed generally enters into combination with the acid employed, and forms a metalic ſalt; but when carried to its higheſt degree, the oxide is often inſoluble.

Disoxygenizement of Metallic Oxides and Acids.

545. This proceſs was formerly termed *reduction*, from its reſtoring them to their metallic ſplendour, and is performed by cauſing ſome body to act upon them, which has a greater affinity for oxygen than they have. The different metals themſelves vary very much in the degree of this affinity, ſo that they are reduced with very different degrees of facility. Gold, ſilver, platinum, and mercury, are reduced by merely expoſing them to a ſufficient degree of heat in cloſe veſſels. The oxygen at this temperature has a greater affinity for caloric than for the metals, and is therefore driven off in the form of very pure oxygen gas.

546. The other metallic oxides which reſiſt the ſimple action of heat, may be reduced by melting them in contact with charcoal, or ſubſtances which may be charred, ſuch as oil, fat, roſin, pitch, &c. Beſides the charcoal, different ſaline fluxes are alſo added to facilitate the fuſion of the oxide.

547. The oxide to be reduced is mixed with a ſufficient quantity of any of theſe ſubſtances, and placed in the bottom of a crucible, which is afterwards filled up with charcoal powder, to pre-

vent entirely the accefs of the air, and expofed for a length of time to a fufficiently high temperature, when a button of the metal will commonly be found in the bottom of the crucible. Upon the volatile metals, fuch as arfenic and zinc, this operation muft be performed in a diftilling or fubliming apparatus. Some metallic oxides, fuch as thofe of platinum, columbium, &c. cannot be reduced, from our being unable to produce a degree of heat fufficient to melt them.

548. Metals may be alfo obtained from the metallic falts, by inferting in a folution of thefe a plate of another metal, poffeffing a ftronger affinity for oxygen and for the acid. Thus copper is precipitated by iron, and arfenic by zinc. We muft only take care that the two metals have no remarkable affinity for each other, as in that cafe an alloy is commonly produced. For example, when mercury is placed in a folution of filver, a cryftallized amalgam of filver is obtained, formerly called the Arbor Dianæ.

549. The compound oxides may be further oxygenized, by treating them with nitric acid. In this way various oxides and acids are formed, according to the nature of the oxide operated on, the quantity of the acid, and the mode of conducting the procefs.

550. They alfo undergo changes by gradually combining with the oxygen of the atmofphere. In fome cafes, this combination is attended with remarkable phenomena, which have been claffed under the term *fermentation.*

551. There are feveral fpecies of fermentation, which have been named from the products they afford.

1. The faccharine, which produces fugar.
2. The vinous, which produces wine, beer, and fimilar fluids.
3. The panary, which produces bread.
4. The acetous, which produces vinegar.
5. The putrefactive, which produces ammonia.

552. The fame fubftances are fometimes capable of undergoing the firft, fecond, fourth, and fifth; or third, fourth, and fifth, fucceffively, but never in a retrograde order.

553. The conditions neceffary for all of them are,

1. The prefence of a fufficient quantity of fermentable matter.
2. The prefence of a certain proportion of water.
3. The contact of atmofpheric air; and,
4. A certain temperature.

554. *The faccharine fermentation.*—The feeds of barley, when

moiſtened with a certain quantity of water, and expoſed to the contact of the atmoſpheric air, at a temperature of not leſs than 50°, ſwell, and ſhew marks of incipient vegetation, by puſhing forth the radicle. If at this period the fermentation be checked, by expoſing them to a conſiderable degree of heat, and drying them thoroughly, the inſipid amylaceous matter, of which the ſeeds principally conſiſted, will be found to be changed in part into a ſweet ſaccharine ſubſtance. The oxygen of the air, in contact with the ſeeds, is at the ſame time converted into carbonic acid gas, by combining with part of the carbon of the ſeeds; and there is a conſiderable increaſe of temperature in the fermenting maſs, even to ſuch a degree as ſometimes to ſet it on fire. Similar phenomena occur in the maturation of fruits, in the cookery of ſome roots and fruits, and during the heating of hay, when put up too wet.

555. *The vinous fermentation.*—The conditions neceſſary for the vinous fermentation, are the preſence of proper proportions of ſugar, acid, extract, and water, and a temperature of about 70°. When theſe circumſtances exiſt, an inteſtine motion commences in the fluid; it becomes thick and muddy, its temperature increaſes, and carbonic acid gas is evolved. After a time the fermentation ceaſes, the feces riſe to the top, or ſubſide to the bottom, the liquor becomes clear, it has loſt its ſaccharine taſte and aſſumed a new one, and its ſpecific gravity is diminiſhed. If the fermentation has been complete, the ſugar is entirely decompoſed, and the fermented liquor conſiſts of a large proportion of water, of alcohol, of malic acid, of extract, of eſſential oil, and colouring matter. The ſubſtances moſt commonly ſubjected to this fermentation are muſt, which is the expreſſed juice of the grape, and which produces the beſt wines; the juice of the currant and gooſeberry, which, with the addition of ſugar, form our home-made wines; the juices of the apple and pear, which give cyder and perry; and an infuſion of malt, which, when fermented with yeaſt, forms beer. The briſkneſs and ſparkling of ſome of theſe liquors depends on their being put into cloſe veſſels before the fermentation is completed, by which means a portion of carbonic acid gas is retained.

556. *The acetous fermentation.*—All vinous liquors are ſuſceptible of the acetous fermentation, provided they be expoſed to the action of the atmoſphere, in a temperature not leſs than 70°. An inteſtine motion and hiſſing noiſe ſenſibly take place in the fluid, it becomes turbid, with filaments floating in it, and its temperature increaſes, it exhales a pungent acid ſmell, without any diſengagement of carbonic acid gas. Gradually theſe phenomena ceaſe; the temperature decreaſes, the motion ſubſides, and the liquor becomes clear, having depoſited a ſediment and red glairy

matter, which adheres to the fides of the veffel. During this procefs, the alcohol and malic acid difappear entirely, oxygen is abforbed, and acetous acid formed.

557. *The panary and colouring fermentation*—is lefs underftood than thofe already defcribed. A pafte of wheat flour and water, expofed at a temperature of 65°, fwells, emits a fmall quantity of gas, and acquires new properties. The gluten difappears, and it acquires a four difagreeable tafte. If a juft proportion of this fermented pafte or leaven, or what is ftill better, if fome barm be formed into a pafte with wheat-flower and water, the fame fermentation is excited, without the difagreeable tafte being produced; the gas evolved is prevented from efcaping by the vifcidity of the pafte, which therefore fwells, and if baked, forms light fpongy bread.

558. *The putrefactive fermentation.*—Although vegetable fubftances, when they are deftroyed by fpontaneous decompofition, are faid to putrify, we fhall confider this fermentation as belonging exclufively to animal fubftances, or thofe which contain nitrogen as an elementary principle. The effential conditions of putrefaction are humidity, and a temperature between 45° and 110°. The prefence of air, the diminution of preffure, and the addition of ferments, are not effential, but accelerate its progrefs. The fmell is at firft infipid and difagreeable, but afterwards infupportably fetid, although the fetor, for a time, is fomewhat diminifhed by the mixture of an ammoniacal odour. Liquids become turbid and flocculent. Soft fubftances melt down into a gelatinous mafs, in which there is a kind of gentle motion and fwelling up, from the flow and fcanty formation of elaftic fluids. Solids, befides the general foftening, exude a ferofity of various colours, and by degrees the whole mafs diffolves, the fwelling ceafes, the matter fettles, and its colour deepens; at laft its odour becomes fomewhat aromatic, its elements are finally diffipated, and there remains only a kind of fat, vifcid, and ftill fetid mould. The products of putrefaction are carburetted, fulphuretted, and phofphuretted hydrogen gafes, water, ammonia, azote, and carbonic acid. Thefe are all diffipated in the form of gas or vapour. When in contact with air, oxygen is abforbed. Acetic acid, a fatty matter, a foap compofed of this fat and ammonia, and often the nitric acid, fixed by a falifiable bafe, are alfo produced; and the ultimate remains, befides falts, compofed of acid and earths, contain for a long time a portion of fat charry matter.

APPENDIX.

TABLES OF SIMPLE AFFINITY.

OXYGEN.
Carbon,
Charcoal,
Manganese,
Zinc,
Iron,
Tin,
Antimony,
Hydrogen,
Phosphorus,
Sulphur,
Arsenic,
Nitrogen,
Nickel,
Cobalt,
Copper,
Bismuth,
Caloric?
Mercury,
Silver,
Arsenious acid,
Nitric oxide,
Gold,
Platinum,
Carbonic oxide,
Muriatic acid,
White oxide of manganese,
White oxide of lead.

OXYGEN. *a*.
Titanium,
Manganese,
Zinc,
Iron,
Tin,
Uranium,
Molybdenum,
Tungsten,
Cobalt,
Antimony,
Nickel,
Arsenic,
Chromum,
Bismuth,
Lead,
Copper,
Tellurium,
Platinum,
Mercury,
Silver,
Gold.

CARBON.
Oxygen,
Iron,
Hydrogen.

NITROGEN.
Oxygen,
Sulphur?
Phosphorus,
Hydrogen.

HYDROGEN.
Oxygen,
Sulphur,
Carbon,
Phosphorus,
Nitrogen.

SULPHUR. PHOSPHORUS?
Potass,
Soda,
Iron,
Copper,
Tin,
Lead,
Silver,
Bismuth,
Antimony,
Mercury,
Arsenic,
Molybdenum.

POTASS, SODA, AND AMMONIA.
Acids. Sulphuric,
— Nitric,
— Muriatic,
— Phosphoric,
— Fluoric,
— Oxalic,
— Tartaric,
— Arsenic,
— Succinic,
— Citric,
— Lactic,
— Benzoic,
— Sulphurous,
— Acetic,
— Mucic,
— Boracic,
— Nitrous,
— Carbonic,
— Prussic,
Oil,
Water,
Sulphur.

a. Vauquelin's Table of the affinity of the metals for oxygen, according to the difficulty with which their oxides are decomposed by heat.

TABLES OF SIMPLE AFFINITY CONTINUED.

BARYTA.

Acids. Sulphuric,
— Oxalic,
— Succinic,
— Fluoric,
— Phoſphoric,
— Mucic,
— Nitric,
— Muriatic,
— Suberic,
— Citric,
— Tartaric,
— Arſenic,
— Lactic,
— Benzoic,
— Acetic,
— Boracic,
— Sulphurous,
— Nitrous,
— Carbonic,
— Pruſſic,
Sulphur,
Phoſphorus,
Water,
Fixed oil.

STRONTIA.

Acids. Sulphuric,
— Phoſphoric,
— Oxalic,
— Tartaric,
— Fluoric,
— Nitric,
— Muriatic,
Acids. Succinic,
— Acetic,
— Arſenic,
— Boracic,
— Carbonic,
Water.

LIME.

Acids. Oxalic,
— Sulphuric,
— Tartaric,
— Succinic,
— Phoſphoric,
— Mucic,
— Nitric,
— Muriatic,
— Suberic,
— Fluoric,
— Arſenic,
— Lactic,
— Citric,
— Malic,
— Benzoic,
— Acetic,
— Boracic,
— Sulphurous,
— Nitrous,
— Carbonic,
— Pruſſic,
Sulphur,
Phoſphorus,
Water,
Fixed oil.

MAGNESIA.

Acids. Oxalic,
— Phoſphoric,
— Sulphuric,
— Fluoric,
— Arſenic,
— Mucic.
— Succinic,
— Nitric
— Muriatic,
— Tartaric,
— Citric,
— Malic ?
— Lactic,
— Benzoic,
— Acetic,
— Boracic,
— Sulphurous,
— Nitrous,
— Carbonic,
— Pruſſic,
Sulphur.

ALUMINA.

Acids. Sulphuric,
— Nitric,
— Muriatic,
— Oxalic,
— Arſenic,
— Fluoric,
— Tartaric,
— Succinic,
— Mucic,
— Citric,
Acids Phoſphoric
— Lactic,
— Benzoic,
— Acetic,
— Boracic,
— Sulphurous,
— Nitrous,
— Carbonic,
— Pruſſic.

SILICA.

Fluoric acid,
Potaſs.

OXIDE OF PLATINUM. OXIDE OF GOLD. *a.*

Gallic acid,
Muriatic,
Nitric,
Sulphuric,
Arſenic,
Fluoric,
Tartaric,
Phoſphoric,
Oxalic,
Citric,
Acetic,
Succinic,
Pruſſic,
Carbonic,
Ammonia.

a. Omitting the oxalic, citric, ſuccinic, and carbonic, and adding ſulphuretted hydrogen after ammonia.

TABLES OF SIMPLE AFFINITY CONTINUED.

OXIDE OF SILVER.

Gallic acid,
Muriatic,
Oxalic,
Sulphuric,
Mucic,
Phosphoric,
Sulphurous,
Nitric,
Arsenic,
Fluoric,
Tartaric,
Citric,
Lactic,
Succinic,
Acetic,
Prussic,
Carbonic,
Ammonia.

OXIDE MERCUURY.

Gallic acid,
Muriatic,
Oxalic,
Succinic,
Arsenic,
Phosphoric,
Sulphuric,
Mucic,
Tartaric,
Citric,
Malic,
Sulphurous,
Nitric,
Fluoric,
Acetic,
Benzoic,

Boracic,
Prussic,
Carbonic.

OXIDE OF LEAD.

Gallic,
Sulphuric,
Mucic,
Oxalic,
Arsenic,
Tartaric,
Phosphoric,
Muriatic,
Sulphurous,
Suberic,
Nitric,
Fluoric,
Citric,
Malic,
Succinic,
Lactic,
Acetic,
Benzoic,
Boracic,
Prussic,
Carbonic,
Fixed oils,
Ammonia.

OXIDE OF COPPER.

Gallic,
Oxalic,
Tartaric,
Muriatic,
Sulphuric,
Mucic,
Nitric,
Arsenic,

Phosphoric,
Succinic,
Fluoric,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic,
Fixed alkalies,
Ammonia,
Fixed oils.

OXIDE OF ARSENIC.

Gallic,
Muriatic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Phosphoric,
Fluoric,
Succinic,
Citric,
Acetic,
Prussic,
Fixed alkalies,
Ammonia,
Fixed oils,
Water.

OXIDE OF IRON.

Gallic,
Oxalic,
Tartaric,
Camphoric,
Sulphuric,
Mucic,

Muriatic,
Nitric,
Phosphoric,
Arsenic,
Fluoric,
Succinic,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic.

OXIDE OF TIN. *a*.

Gallic,
Muriatic,
Sulphuric,
Oxalic,
Tartaric,
Arsenic,
Phosphoric,
Nitric,
Succinic,
Fluoric,
Mucic,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Ammonia.

OXIDE OF ZINC.

Gallic,
Oxalic,
Sulphuric,
Muriatic,
Mucic,

a. Bergmann places the tartaric before the muriatic.

TABLES OF SIMPLE AFFINITY CONTINUED.

Nitric,
Tartaric,
Phoſphoric,
Citric,
Succinic,
Fluoric,
Arſenic,
Lactic,
Acetic,
Boracic,
Pruſſic,
Carbonic,
Fixed alkalies,
Ammonia.

OXIDE
OF ANTIMONY.

Gallic,
Muriatic,
Benzoic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Mucic,
Phoſphoric,
Citric,
Succinic,
Fluoric,
Arſenic,
Lactic,
Acetic,
Boracic,
Pruſſic,
Fixed alkalies.
Ammonia,

SULPHURIC
ACID
PRUSSIC. *a.*

Baryta,
Strontia,
Potaſs,
Soda,
Lime,
Magneſia,
Ammonia,
Glucina,
Gadolina,
Alumina,
Zirconia,
Metallic oxides.

SULPHUROUS
ACID.
SUCCINIC. *b.*

Baryta,
Lime,
Potaſs,
Soda,
Strontia,
Magneſia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides.

PHOSPHORIC
ACID.
CARBONIC. *c.*

Baryta,
Strontia,
Lime,
Potaſs,
Soda,
Ammonia,
Magneſia,
Glucina,
Alumina,
Zirconia,
Metallic oxides,
Silica.

PHOSPHOROUS
ACID.

Lime,
Baryta,
Strontia,
Potaſs,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides

NITRIC ACID.
MURIATIC —*d.*

Baryta,
Potaſs,

Soda
Strontia,
Lime,
Magneſia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides.

FLUORIC ACID
BORACIC —*e.*
ARSENIC —*f.*
TUNGSTIC —

Lime,
Baryta,
Strontia,
Magneſia,
Potaſs,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Silica.

ACETIC ACID.
LACTIC —
SUBERIC—*g.*

Baryta,
Potaſs,
Soda,
Strontia,

a. With the omiſſion of all after ammonia.

b. Ammonia ſhould come before magneſia, and ſtrontia, glucina, and zirconia ſhould be omitted.

c. Magneſia ſhould ſtand above ammonia, and alumina and ſilica ſhould be omitted.

d. Ammonia ſhould ſtand above magneſia.

e. Silica ſhould be omitted, and inſtead of it water and alcohol be inſerted.

f. Except ſilica.

g. With the omiſſion of ſtrontia, metallic oxides, glucina and zirconia.

TABLES OF SIMPLE AFFINITY CONTINUED.

Lime, Ammonia, Magneſia.	BENZOIC ACID.	FIXED OIL.	SULPHURETTED HYDROGEN.
Metallic oxides, Glucina, Alumina, Zirconia.	White oxide of arſenic, Potaſs, Soda, Ammonia, Baryta, Lime, Magneſia, Alumina.	Lime, Baryta, Potaſs, Soda, Magneſia, Oxide of Mercury, Other metallic oxides, Alumina.	Baryta, Potaſs, Soda, Lime, Ammonia, Magneſia, Zirconia.
OXALIC ACID TARTARIC— CITRIC —*a*.	CAMPHORIC ACID.	ALCOHOL.	
Lime, Baryta, Strontia, Magneſia, Potaſs, Soda, Ammonia, Alumina, Metallic oxides, Water, Alcohol.	Lime, Potaſs, Soda, Baryta, Ammonia, Alumina, Magneſia.	Water, Ether, Volatile oil, Alkaline Sulphurets.	

a Zirconia after alumina.

Cases of Mutual Decomposition.

1. From Simple Affinity. (20. *a.*)

Sulphate of Potafs,	with	Muriate of Baryta.
Soda,	—	Nitrate of Potafs.
Ammonia,	—	Muriate of Soda.
Magnefia,	—	Carbonate of Potafs.
Super-fulphate of Alumina,	—	Muriate of Lime.
Nitrate of Potafs,	—	Baryta.
Ammonia,	—	Phofphate of Soda.
Muriate of Baryta,	—	All the Sulphates and Nitrates.
Soda,	—	Carbonate of Potafs.
Lime,	—	Sub-borate of Soda.
Ammonia,	—	Carbonate of Potafs.
Phofphate of Soda,	—	Muriate of Ammonia.
Sub-borate of Soda,	—	Carbonate of Potafs.
Nitrate of Silver,	—	Muriate of Soda.
Acetate of Lead,	—	Citrate of Potafs.
Sulphate of Mercury,	—	Muriate of Soda.
Soap of Potafs,	—	Muriate of Soda.
Soap of Soda,	—	Sulphate of Lime.

2. From Compound Affinity. (20. *b.*)

Sulphate of Baryta,	with	Carbonate of Potafs.
Sulphate of Baryta,	—	Soda.
Potafs,	—	Muriate of Lime.
Soda,	—	Muriate of Lime.
Muriate of Baryta,	—	Phofphate of Soda.
	—	Sub-borate of Soda.
	—	Carbonate of Potafs.
	—	Soda.
	—	Ammonia.
Muriate of Lime,	—	Carbonate of Ammonia.
Phofphate of Soda,	—	Lime.
Acetate of Lead,	—	Sulphate of Zinc.
Acetate of Lead,	—	Nitrate of Mercury.

Cases of Disposing Affinity. (20. *c.*)

The formation of water by the action of the fulphuric acid on the compound oxides.

The oxidation of metals by water, in confequence of the prefence of an acid.

THERMOMETERS.

Fahrenheit's thermometer is univerſally uſed in this kingdom. In it the range between the freezing and boiling points of water is divided into 180 degrees; and as the greateſt poſſible degree of cold was ſuppoſed to be that produced by mixing ſnow and muriate of ſoda, it was made the zero, and the freezing point became 32°, and the boiling pint 212°.

The centrigrade thermometer of Revolutionized France, places the zero at the freezing point, and divides the range between it and the boiling point into 100°. This has long been uſed in Sweden under the title of Celſius's thermometer.

Reaumur's thermometer, which was formerly uſed in France, divides the ſpace between the freezing and boiling of water into 80°, and places the zero at the freezing point.

Wedgewood's pyrometer is only intended to meaſure very high temperatures. Its zero correſponds with 1077° of Fahrenheit's, and each degree of Wedgewood is equal to 130 of Fahrenheit.

Therefore 180° F. $= 100^\circ$ C. $= 80^\circ$ R. $= \frac{18}{13}$ W.

Or to reduce centrigrade degrees to thoſe of Fahrenheit, multiply by 9 and divide by 5, and to the quotient add 32, that is, $\frac{9\,C}{5} + 32 = F$.

To reduce Reamur's to Fahrenheit's, we have the following formula, $\frac{9\,R}{4} + 32 = F$.

To reduce Wedgewood's degrees to thoſe of Fahrenheit, we have $130\,W + 1077 = F$.

Or inverſely,

$$\frac{5\,F - 160}{\quad} = C, \qquad \frac{4\,F - 128}{\quad} = R. \qquad \frac{F. - 1077}{130} = W.$$

TABLE *of the Degrees of different Thermometers, omitting Fractions, at which some remarkable Chemical Phenomena occur.*

REAU.	FAHR.	CENT.	
—54	—90	—68	Cold produced by Mr. Walker.
—44	—66	—55	Nitric acid freezes, Fourcroy.
—36	—50	—44	Cold observed at Hudson's Bay, Mr. M'Nab.
—35	—46	—43	Ether freezes.
—34	—45	—42	Ammonia exists in a liquid form.
—32	—39	—39	Mercury freezes.
—30	—36	—37	Sulphuric acid freezes, (Thomson).
—28	—31	—35	Sulphurous acid liquid, (Monge).
—24	—23	—30	Cold observed at Glasgow on the surface of snow, 1780.
—23	—22	—30	Acetous acid freezes.
—20	—14	—25	Cold observed at Glasgow, 1780.
—19	—11	—24	Two parts of alcohol and one of water freeze.
—17	— 7	—14	Brandy freezes.
—14	0	—18	Cold produced by mixing equal parts of snow and muriate of soda.
— 7	16	— 9	Oil of turpentine freezes, Margueron. Did not freeze at—18, Morelli.
— 5	20	— 6	Strong wines freeze.
— 4	23	— 5	Fluoric acid freezes, (Priestley). Oils of bergamot and cinnamon freeze, (Marg.)
— 3	25	— 4	Human blood freezes.
— 2	28	— 2.5	Vinegar freezes.
— 1	30	— 1.25	Milk freezes.
0	32	0	Oxymuriatic acid melts, (Thomson.) Water freezes.
2	36	2.5	Olive oil freezes.
4	40	5	Oxymuriatic acid boils, (Thomson.)—Equal parts of phosphorus and sulphur melt, (Pelletier).
5	43	6	Phosphorus burns slowly.
6	45		Sulphuric acid, specific gravity 1.78, freezes, (Keir).
10	55	12	to 66 putrid fermentation, (Fourcroy).
12	59	15	Vinous fermentation begins, (Fourc.)

Reau.	Fahr.	Cent.	
14	64	17	Oil of anife freezes,
15	66	18	to 133, F. Animal putrefaction, to 70 panary fermentation.
16	68	20	Camphor evaporates, (Fourcroy).
19	75	24	Summer heat at Edinburgh
20	77	25	Vinous fermentation rapid, (Fourcroy). Acetous ditto begins.
21	80	26	Phofphorus burns in oxygen gas. 104, Goettling.
22	82	28	The adipocere of mufcle melts.
25	88	31	Acetous fermentation ceafes, (Fourc.) Phofphorus is ductile. F.
28	96	35	to 100, animal heat.
	97		Axunge melts, (Nicholfon).
29	98	36	Ether boils.
30	99	37	Phofphorus melts, (Pelletier).
32	104	40	Refin of bile melts.
33	107	41	Feverifh heat.
34	109	42	Myrtle wax melts, (Cadet).
36	112	45	Spermaceti melts, (Boftock).
40	122	50	Phofphorus burns vividly, (Fourcroy). 148, (Thomfon).
42	127	53	Tallow melts, (Nicholfon).
44	130	54	Ammonia is feparated from water.
48	140	60	Ammonia boils, (Dalton).
49	142	61	Bees wax melts, (Irvine).
50	145	63	Camphor fublimes, (Venturi). Ambergris melts, (La Grange).
55	155	79	Bleached wax melts, (Nicholfon).
59	165	74	Albumen coagulates. 156, (Black).
61	170	77	Sulphur evaporates, (Kirwan).
64	176	80	Alcohol boils. 174, (Black).
90	235	116	Adipocere of biliary calculi melts, (Fourcroy).
80	212	100	Water and volatile oils boil.
			Bifmuth 5 parts, tin 3, and lead 2, melt.
83	219	104	Phofphorus begins to diftil, (Pelletier).
88	230	110	Muriate of lime boils, (Dalton).
89	234	111	Sulphur Melts, Hope. (212°, Fourcroy). (185°, Kirwan.
93	242	116	Nitrous acid boils.
96	248	120	Nitric acid boils.

Reau.	Fahr.	Cent.	Wed.	
112	283	140		White oxide of arfenic fublimes. Alloy of equal parts of tin and bifmuth melts.
120	303	150		Sulphur burns flowly, and camphor melts, (Venturi).
134	334	168		Alloys, tin 3, and lead 2, and tin 2, bifmuth 1, melt.
182	442	227		Tin melts, Chrichton. (413, Irvine).
190	460	238		Tin 1, and lead 4, melt.
197	476	248		Bifmuth melts, (Irvine).
226	540	282		Arfenic fublimes.
232	554	290		Phofphorus boils, (Pelletier).
235	560	294		Oil of turpentine boils,
248	590	310		Sulphuric acid boils, (Dalton). 546, Black. 540, Bergm.
252	600	315		Linfeed oil boils. Sulphur fublimes, (Davy). 570, Thomfon.
258	612	325		Lead melts, Crichton. (594, Irvine). 585, Secundat. (540, Newton).
269	635	335		Loweft ignition of iron in the dark.
279	660	350		Mercury boils, (Dalton). 644, Secundat. 600, Black.
297	700	371		Zinc melts.
315	750	384		Iron bright red in the dark
341	800	427		Hydrogen gas burns. 1000, Thomfon.
342	802	428		Charcoal burns, (Thomfon).
345	809	432		Antimony melts.
380	884	475		Iron red in the twilight.
448	1050	560		Iron red hot in a common fire.
462	1077	577	1	Red heat in day light.
564	1300	705	1.7+	Azotic gas burns.
737	1807	986	6	Enamel colours burnt.
1451	2897	1814	14	Diamond burns. 1, Sir G. M'Kenzie. 500, Morveau.
1678	3807	2100	21	Brafs melts.
2024	4587	2530	27	Copper melts.
2082	4717	2602	28	Silver melts.
2130	4847	2700	29	Settling heat of plate glafs.
2313	5237	2780	32	Gold melts.

Reau.	Fahr.	Cent.	Wed.	
2880	6507	3580	40	Delft ware fired.
3750	8480	4680	57	Working heat of plate glaſs.
4450	10177	5610	70	Flint glaſs furnace.
5370	12257	6770	86	Cream coloured ſtone ware fired.
5800	13297	7330	94	Worceſter china vitrified.
6270	14337	7850	102	Stoneware fired.
6520	14727	8150	105	Chelſea china vitrified.
6925	15637	8650	112	Derby.
7025	15897	8770	114	Flint glaſs furnace greateſt heat.
7100	16007	8880	121	Bow china vitrified.
			123	Equal parts of chalk and clay melt.
7460	16807	9320	124	Plate glaſs furnace ſtrongeſt heat.
7650	17327	9600	125	Smith's forge.
7975	17977	9850	130	Cobalt melts. Caſt iron melts.
8250	18627	10320	135	Briſtol china no vitrification at.
9131	20577	11414	150	Nickel melts. Heſſian crucible melted.
9325	21097	11680	154	Soft iron nails melted with the crucible.
9602	21637	12001	158	Iron melts.
9708	21877	12136	160	Manganeſe melts. Air furnace.
10280	23177	12857	170+	Platinum, tungſten, molybdenum, uranium, and titanium, melt.
11106	25127	13900	185	Greateſt heat obſerved.

N. B. As many of theſe higher numbers were calculated from Wedgewood's, by the ſliding rule, the two or three firſt figures only can be depended upon as correct. They will be found however to be ſufficiently accurate for moſt purpoſes.

Table of Freezing Mixtures.

During the solution of many saline bodies, a very considerable reduction of temperature takes place. We shall extract from Mr. Walker's paper a few of the most convenient mixtures employed for this purpose.

A mixture of		*reduces the temperature*
Muriate of ammonia, Nitrate of potass, Water,	5 parts. 5 16	from 50° to 10°.
Sulphate of soda, Muriatic acid,	8 5	from 50° to 0°.
Snow, Muriate of soda,	1 1	from 32° to 0°.
Snow, Muriate of soda,	2 1	from 0° to—5°.
Snow, Muriate of soda, Muriate of ammonia, and Nitrate of potass,	1 5 5	from—5° to 18°.
Snow, Muriate of soda, Nitrate of ammonia,	12 5 5	from–18° to–25°.
Snow, Diluted sulphuric acid,	1 1	from 20° to—60°.
Snow, Muriate of lime,	2 3	from 32° to—50°.
Snow, Muriate of lime,	1 3	from—40° to—73°.
Snow, Diluted sulphuric acid,	8 10	from—68° to—91°.

The salts ought to be recently crystallized, and reduced to a very fine powder, and the mixture should be made as quickly as possible. To produce a very great degree of cold, the materials must be previously cooled down by means of other mixtures.

TABLE of ſome GALVANIC CIRCLES, Compoſed of two Perfect Conductors, and one Imperfect Conductor, (Davy).

More oxygenizable ſubſtances.		Leſs oxygenizable ſubſtances.	Oxygenizing fluids.	
	Zinc,	with gold, charcoal, ſilver, copper, tin, iron, mercury.		Solutions of nitric acid in water, of muriatic acid, ſulphuric acid, &c. Water, holding in ſolution oxygen, atmoſpheric air.
	Iron,	—— gold, charcoal, ſilver, copper, tin.		
	Tin,	—— gold, ſilver, charcoal.		
	Lead,	gold, ſilver.		
	Copper,	—— gold, ſilver.		Solution of nitrates of ſilver, and mercury.
	Silver,	—— gold.		Nitric acid, acetous acid. Nitric acid.

TABLE of ſome GALVANIC CIRCLES, Compoſed of two Imperfect Conductors, and one Perfect Conductor.

Perfect Conductors.	Imperfect Conductors.	Imperfect Conductors.
Charcoal, Copper, Silver, Lead, Tin, Iron, Zinc,	Solutions of hydroguretted alkaline ſulphurets, capable of acting on the firſt three metals, but not on the laſt three.	Solutions of nitrous acid, oxygenized muriatic acid, &c. capable of acting on all the metals.

Weights and Measures.

"To employ, as the fundamental unity of all meaſures, a type "taken from nature itſelf, a type as unchangeable as the globe "on which we dwell,—to propoſe a metrical ſyſtem, of which all "the parts are intimately connected together, and of which the "multiples and ſubdiviſions follow a natural progreſſion, which "is ſimple, eaſy to comprehend:—this is moſt aſſuredly a beauti- "ful, great, and ſublime idea, worthy of the enlightened age in "which we live."

Such were the ideas which influenced the French National Inſtitute, when they choſe as the baſe of the whole metrical ſyſtem, the fourth part of the terreſtrial meridian between the equator and the north pole. They adopted the ten millionth part of this arc for the unity of meaſure, which they denominated *metre*, and applied it equally to ſuperficial and ſolid meaſures, taking for the unity of the former the ſquare of the decuple, and for that of the latter the cube of the tenth part of the metre. They choſe for the unity of weight, the quantity of diſtilled water which the ſame cube contains when reduced to a conſtant ſtate preſented by nature itſelf; and laſtly, they decided that the multiples and ſub-multiples of each kind of meaſure, whether of weight, capacity, ſurface, or length, ſhould be always taken in the decimal progreſſion, as being the moſt ſimple, the moſt natural, and the moſt eaſy, for calculation, according to the ſyſtem of numeration which all Europe has employed for centuries.

By a careful meaſurement of the arc between Dunkirk and Mountjouy, they found the length of the metre to be equal to 443.296 lines of the toiſe of Peru. The cubic decimetre of diſtilled water, taken as its maximum of denſity and weight *in vacuo*, that is the unity of weight, was found to be 18827.15 grains of the pile of Charlemagne. By actual compariſon, the metre was found to be equal to 39.371 Engliſh inches at 62°, the temperature univerſally employed in the compariſon of Engliſh ſtandards: and upon theſe data the following tables have been conſtructed.

TABLES OF WEIGHTS AND MEASURES.

Measures of Length; the Metre being at 32°, and the foot at 62°.

		English inches.		Mil.	Fur.	Yds.	Feet.	Inch.
Millimetre	=	·03937						
Centimetre	=	·39371						
Decimetre	=	3·93710						
Metre	=	39·37100						
Decametre	=	393·71000	=	0	0	10	2	9·7
Hecatometre	=	3937·10000	=	0	0	109	1	1
Chiliometre	=	39371.00000	=	0	4	213	1	10.2
Myriometre	=	393710.00000	=	6	1	156	0	6.

Measures of Capacity,

		Cubic inches.		*English.* Tons.	Hogs.	Wine gall.	Pints.
Millilitre	=	.06103					
Centilitre	=	.61028					
Decilitre	=	6.10280					
Litre	=	61.02800	=	0	0	0	2.1133
Decalitre	=	610.28000	=	0	0	2.	5.1352
Hecatolitre	=	6102.80000	=	0	0	26.419	
Chiliolitre	=	61028.00000	=	1	0	12.19	
Myriolitre	=	610280·00000	=	10	1	58.9	

Wine Measure.

Gallon.		Pints.		Ounces.		Drachms.		Cub. Inch.		Litres.
1	=	8	=	128	=	1024	=	231	=	3.78515
		1	=	16	=	128	=	28.875	=	0.47308
				1	=	8	=	1.8047	=	0.02957
						1	=	0.2256	=	0.00396

Measures of Weight.

		English grains.		*Avoirdupois.* Pound.	Oun.	Dram.
Milligramme	=	.0154				
Centigramme	=	.1544				
Decigramme	=	1.5444				
Gramme	=	15.4440				
Decagramme	=	154.4402	=	0	0	5.65
Hecatogramme	=	1544.4023	=	0	3	8.5
Chiliogramme	=	15444.0234	=	2	3	5
Myriogramme	=	154440.2344	=	22	1	2

Troy Weight.

Pound.		Ounces.		Drachms.		Scruples.		Grains.		Grammes.
1	=	12	=	96	=	288	=	5760	=	372.96
		1	=	8	=	24	=	480	=	31.08
				1	=	3	=	60	=	3.885
						1	=	20	=	1.295
								1	=	0.06475

Avoirdupois Weight.

Pound.		Ounces.		Drachms.		Grains.		Grammes.
1	=	16	=	256	=	7000	=	453.25
		1	=	16	=	437.5	=	28.32
				1	=	27.975	=	1.81

Table of Specific Gravities corresponding to the degrees of Baumé's hydrometer, 55° Fahrenheit.

For Spirits *and Fluids lighter than Water.*

		SP. GR.			SP. GR.
40	=	817	25	=	897
35	=	842	20	=	928
30	=	867	15	=	963

For Salts *and Fluids heavier than Water.*

SPIRITS.		SP. GR.		SALTS.	SP. GR.		SALTS.
10	=	1000	=	0	1373	=	39
		1040	=	6	1455	=	45
0	=	1072	=	10	1547	=	51
		1089	=	12	1594	=	54
		1114	=	15	1717	=	60
		1170	=	21	1848	=	66
		1200	=	24	1920	=	69
		1261	=	30	2000	=	72
		1333	=	36			

Comparative Weights of Gaseous Fluids.

	100 CUBIC INCHES.		SPECIFIC GRAVITY.		
	French, in French grains.	English, in Troy grains.	Standard. Water.	Standard. Air.	
Water	37419.8		1000.	813.5	L.
Ditto		25242.2	1000	814.3	S.
Atmospheric air	46.		1.2293	1.	L.
Ditto		31.	1.2279	1.	S.K.
Oxygen	51.		1.365	1.11	L.
Ditto		34.	1.35	1.09	K.
Ditto		35.09	1.39	1.13	D.
Nitrogen	44.44		1.19	0.965	L.
Ditto		30.535	1.21	0.985	K.
Ditto		30.45	1.20	0.98	D.
Ammonia		18.16	0.[illegible]15	0.585	K.
Ditto		18.	0.713	0.58	D.
Hydrogen	3.5		0.0[illegible]35	0.076	K.
Ditto		2.613	0.1[illegible]31	0.084	K.
Hydrocarbonous oxides }		14.5	0.573	0.467	C.
		16.	0.632	0.5[illegible]6	C.
		20.	0.78	0.645	C.
		21.	0.83	0.677	C.
Carbonic oxide		30.	1.185	0.965	C.
Carbonic acid		46.5	1.84	1.5	K.
		45.5	1.802	1.47	D.
Nitrous oxide		50.1	1.985	1.615	D.
Nitric oxide		37.	1.465	1.193	K.
Ditto		34.3	1.36	1.105	D.
Nitric acid		76.	3.	2.425	D.
Sulphuretted hydrogen		34.286	1.36	1.205	K.
Sulphurous acid		70.215	2.75	2.24	K.
Muriatic acid	66.		1.765	1.43	B.

L. Lavoisier. S. Shuckburgh. K. Kirwan. D. Davie. C. Cruickshank. B. Brisson.

Solids.

Diamond -	3.5212	*Carbonate of foda,	1.7377
Native fulphur	2.0332	*——— magnefia,	0.294
Melted do. -	1.9907	Ambergris, -	0.9263
Phofphorus -	1.7140	Tallow, -	0.9419
Platinum rolled,	22.0690	Hogs lard, -	0.9478
Gold hammered,	19.3617	Yellow wax, -	0.9648
Tungften	17.6	White do. -	0.9686
Mercury, at—40°	15.612	Spermaceti, -	0.9433
Sulphuret of do.	10.	Rofin, -	1.0727
Lead melted, -	11.3523	Sandarac, -	1.0920
Silver hammered,	10.5107	Maftich, -	1.0742
Bifmuth melted,	9.8227	Copal, -	1.0452
Nickel do. -	9.	Amber, -	1.0780
Copper wire, -	8.8785	Elemi, -	1.0682
Cobalt, -	8.5384	Labdanum, -	1.1862
Arfenic -	8.31	Refin of Guaiac,	1.2289
Arfenious acid,	3.706	Refin of jalap, -	1.2185
Bar iron, -	7.788	Dragons' blood,	1.2045
Caft iron. -	7.207	Tacamahaca, -	1.0463
Steel hardened,	7.8404	Benzoin, -	1.0924
Molybdenum, -	7.5	Storax, -	1.1098
Tin hardened,	7.3065	Gum ammoniac,	1.2071
Zinc, -	7.1908	Gamboge, -	1.2216
Manganefe, -	7.	Olibanum, -	1.1732
Antimony, -	6.89	Myrrh, -	1.3600
Sulphuret of do.	4.0643	Scammony, -	1.2354
Glafs of do. -	4.9464	Galbanum, -	1.2120
Uranium, -	6.44	Sagapenum, -	1.2008
Tellurium, -	6.115	Opoponax, -	1.6226
Collumbium, -	5.918	Affafœtida, -	1.3275
*Soda, - -	1.336	Hepatic aloes, -	1.3586
*Strontia, -	1.647	Socotorine aloes,	1.3795
*Sulphate of foda,	1.4457	Opium, -	1.3366
*——— magnefia,	1.6603	Gum arabic, -	1.4523
*Muriate of lime,	1.7603	—— tragacanth,	1.3161
*——— baryta,	2.8257	Extract of liquorice,	1.7228
*——— mercury,	5.1398	——— catechu,	1.4573
*Sub-muriate of mercury,	7.1758	Sarcocoll, -	1.2684
*Tartrate of potafs,	1.5567	Camphor, -	0.9887
*——— foda,	1.7437	Caoutchouc, -	0.9335
*Acetate of foda,	2.109	Indigo, -	0.7690
*——— lead,	2.345	Arnotto, -	0.5956
*——— iron,	1.398	Cork, -	0.2400
*Phofphate of foda,	1.333		

FLUIDS.

Water,	1.0000	Sulphuric ether,	0.7394
Mercury,	13.5681	Nitrous ether,	0.9088
Sulphuric acid,	2.1250	Oil of turpentine,	0.8697
Nitric acid,	1.504	Volatile oil of lavender,	0.8938
Muriatic acid,	1.1940	——— cloves,	1.0363
Acetic do,	1.0135	——— cinnamon,	1.0439
Strong acetic do.	1.0626	Oil of olives,	0.9153
Carbonic acid,	1.0015	—— almonds,	0.9170
Water faturated with ammonia,	0.8970	Linfeed oil,	0.9403
Alcohol,	0.8293	Whale oil,	0.9233

SALTS.

	H.	K.	M.	N.
Potafs,	1.7085	4.6215		
Lime,	1.5233	2.3908	2.3700	
Magnefia,	0.3460	2.3298		
Alumina,	0.8200	2.0000		
Baryta,	2.3740	4.0000		
Sulphate of potafs,	2.4073	2.636	2.398	
——— alumina,	1.7109		1.7260	1.714
——— zinc,	1.9120		1.9	1.712
——— iron,	1.8399		1.88	
——— copper,	2.1943	2.23		
Nitrate of potafs,	1.9369	1.933	1.901	1.900
Muriate of foda,	2.2001		2.0835	2.143
Acetate of lead,	2.3450		2.3953	
Super-tartrate of potafs,	1.9153		1.8745	
Sub-borate of foda,	1.7230		1.7170	1.714
Carbonate of potafs,	2.0120		2.749	
——— foda,	1.3591	1.421		
——— ammonia,	0.9660	1.8245	1.5026	

H. Haffenfratz, K. Kirwan, M. Mufchenbroeck, N. Newton. The very great diffimilarity of thefe eftimations, fhew how difficult it is to afcertain the fpecific gravity of foluble fubftances. Haffenfratz is the laft who has paid particular attention to this fubject; and as he is followed in the beft fyftems of chemiftry, I have inferted in the general table the falts examined by him only, although I muft confefs, that I have no confidence in his refults, as they are frequently contradicted by obvious facts. For example, according to him magnefia is not half the weight of fulphuric ether, and yet it finks in water: I have therefore diftinguifhed thefe by an afterifk.

TABLE *of the* SOLUBILITY *of Saline and other Subſtances*, *in* 100 parts *of Water, at the temperature of* 60° *and* 212°

	60°	212°
Acids.		
Sulphuric,	unlimited.	unlimited.
Nitric,	do.	do.
Acetic,	do.	do.
Pruſſic,	do.	do.
Phoſphoric, Acetic, Tartaric, Malic, Lactic, Laccic,	very ſoluble, proportion not determined.	
Arſenic,	150	
Arſenious acid,	1.25	6.6
Citric,	133	200
Oxalic,	50	100
Gallic,	8.3	66
Boracic,		2
Mucic,	0.84	1.25
Succinic,	{ 4 / 1.04	50
Suberic,	0.69	50
Camphoric,	1.04	8.3
Benzoic,	0.208	4.17
Molybdic,		0.1
Chromic, unknown.		
Tungſtic, inſoluble.		
Salifiable Baſes.		
Potaſs,	50	
Soda, very ſoluble, proportion not known.		
Baryta,	5	50
——— cryſtalliſed,	57	any quantity.
Strontia,	0.6	
——— cryſtallized,	1.9	50
Lime,	0.2	
Salts.		
Sulphate of potaſs,	6.25	20
Super-ſulphate of potaſs,	50	100 +
Sulphate of ſoda,	37.4	125
——— ammonia,	50	100

Temperatures,	60°	212°
Sulphate of magnesia, - - - - - - - - - - - -	100	133
——— alumina, very soluble, proportion unknown.		
Super-sulphate of alumina and potass, } alum,	5	133
——— ammonia, }		
Nitrate of baryta, - - - - - - - - - - - - - - - - -	8	25
——— potass, - - - - - - - - - - - - - - - - -	14.25	100+
——— soda, - - - - - - - - - - - - - - - - - -	33	100
——— strontia, - - - - - - - - - - - - - - - -	100	200
——— lime, - - - - - - - - - - - - - - - - - - -	400	any quantity.
——— ammonia, - - - - - - - - - - - - - - -	50	200
——— magnesia, - - - - - - - - - - - - - - -	100	100 +
Muriate of baryta, - - - - - - - - - - - - - - - -	20	
——— potass, - - - - - - - - - - - - - - - -	33	
——— soda, - - - - - - - - - - - - - - - - - -	35.42	36.16
——— strontia, - - - - - - - - - - - - - - - -	150	any quantity.
——— lime, - - - - - - - - - - - - - - - - - -	200	
——— ammonia, - - - - - - - - - - - - - -	33	100
——— magnesia, - - - - - - - - - - - - - - -	100	
Oxy-muriate of potass, - - - - - - - - - - - - -	6	40
Phosphate of potass, very soluble.		
——— soda, - - - - - - - - - - - - - - - - - -	25	50
——— ammonia, - - - - - - - - - - - - - -	25	25+
——— magnesia, - - - - - - - - - - - - - -	6.6	
Sub-borate of soda, - - - - - - - - - - - - - - - -	8.4	16.8
Carbonate of potass, - - - - - - - - - - - - - - -	25	83.3
——— soda, - - - - - - - - - - - - - - - - -	50	100+
——— magnesia, - - - - - - - - - - - - - -	2	
——— ammonia, - - - - - - - - - - - - - -	50+	100
Acetate of potass, - - - - - - - - - - - - - - - - -	100	
——— soda, - - - - - - - - - - - - - - - - - -	35	
——— ammonia, very soluble.		
——— magnesia do.		
——— strontia, - - - - - - - - - - - - - - -		40.8
Super-tartrate of potass, - - - - - - - - - - -	1.67	3.3
Tartrate of potass, - - - - - - - - - - - - - - -	25	
——— potass and soda, - - - - - - - - - -	25	
Super-oxalate of potass, - - - - - - - - - - - -		10
Citrate of potass, very soluble.		
Prussiate of potass and iron.		
Nitrate of silver very soluble.		
Muriate of mercury (corrosive sublimate),	5	50
Sulphate of copper, - - - - - - - - - - - - - - - -	25	50
Acetate of copper very soluble.		
Sulphate of iron, - - - - - - - - - - - - - - - - - -	50	133
Muriate of iron very soluble.		

	Temperatures, 60°	212°
Tartrate of iron and potafs.		
Acetate of mercury.		
Sulphate of zinc,	44	44+
Acetate of zinc very foluble.		
Acetate of lead, (Ed. Pharm.) Boftock.	27	
——— as it exifts in Goulard's extract, more fo.		
Tartrate of antimony and potafs,	1.25	2.5
——— by my experiments,	6.6	33
Alkaline foaps very foluble.		
Sugar,	100	any quantity.
Gum very foluble.		
Starch,	0	very foluble.
Jelly,	fparingly,	abundantly.
Gelatin,	foluble,	more fo.
Urea very foluble.		
Cinchonin.		

Salts not foluble in 100 *times their weight of water.*

Sulphates of baryta, ftrontia, and lime, and fub-fulphate of mercury.

Phofphates of baryta, ftrontia, lime, magnefia, and mercury.

Fluate of lime.

Carbonates of baryta, ftrontia, and lime.

Muriates of lead, and filver, and fub-muriate of mercury, (Calomel.)

Sub-acetate of copper.

Solubility *of Saline and other Subftances in* 100 *parts of Alcohol, at the temperature of* 176°

All the acids, except the fulphuric, nitric, and oxy-muriatic, which decompofe it, and the phofphoric and metallic acids.	
Potafs, foda, and ammonia, very foluble.	
Red fulphate of iron,	
Muriate of iron,	100
——— lime,	100
Nitrate of ammonia,	89.2
Muriate of mercury,	88.3
Camphor,	75.
Nitrate of filver,	41.7
Refined fugar,	24.6
Muriate of ammonia,	7.1
Arfeniate of potafs,	3.75

Nitrate of potaſs, ---------------------------- 2.9
Arſenate of ſoda, ---------------------------- 1.7
Muriate of ſoda, (Mr. Chenevix). Alkaline ſoaps. Magneſian do. Extractive. Tannin. Volatile oils. Adipocere. Reſins. Urea. Cinchonin.

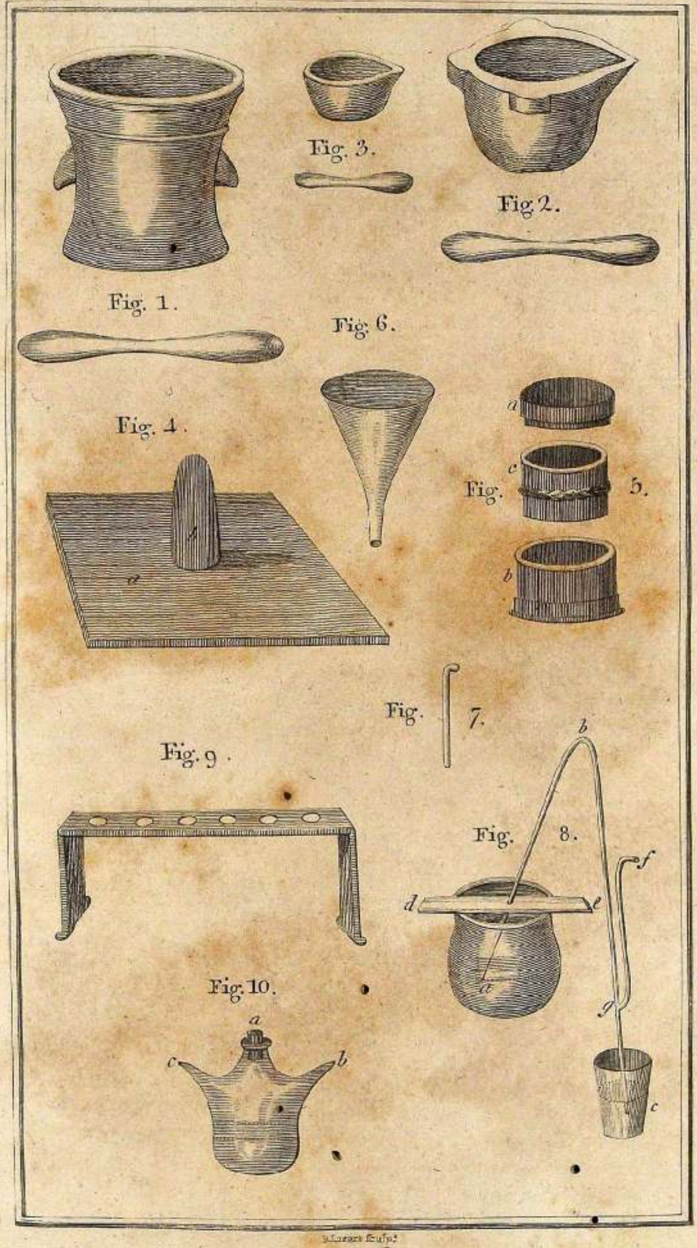
Subſtances inſoluble in Alcohol.

Earths.
Phoſphoric and Metallic acids.
Almoſt all the ſulphates and carbonates.
The nitrates of lead and mercury.
The muriates of lead, ſilver, and ſoda.
The ſub-borate of ſoda.
The tartrate of ſoda and potaſs, and the ſuper-tartrate of potaſs.
Fixed oils, wax, and ſtarch.
Gum, caoutchouc, ſuber, lignin, gelatin, albumen, and fibrin.

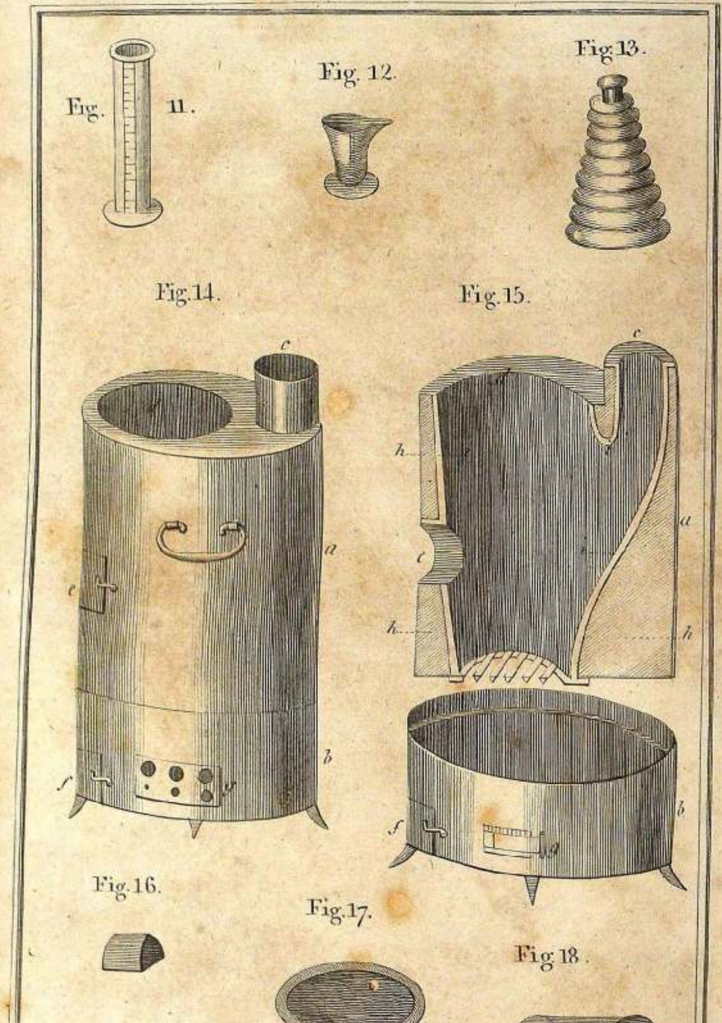
TABLE *of the Abſorption of* GASES *by* 100 *parts of Water at* 60° *F.*

	Weight.	Volume.
Nitric acid,	1083.	361000.
Muriatic acid,	100.	56655.
Ammonia,	34.	47687.
Sulphurous acid, Fourcroy,	33.3	12109.
———— Dr. Thomſon,	9.75	3546.
———— Dr. Prieſtley,	3.96	1440.
Carbonic acid,	0.1872	104.
Sulphuretted hydrogen,	0.1165	85.7
Nitrous oxide,	0.104	52.5
Oxy-muriatic acid,	0.043	
Nitric oxide,	0.0068	5.
Oxygen,	0.005143	3.7
Phoſphuretted hydrogen,	0.00291	2.14
Carbonic oxide,	0.00238	2.01
Hydrogen,	0.0001505	1.61
Nitrogen,	0.001836	1.53
Carburetted hydrogen,		1.40

PLATE 1.



J. Lucas Sculpt.



D. Lizars sculpt

TABLE *of Efflorefcent Salts*, (Cadet de Vaux).

288 grains of	in days	loft grains
Sulphate of foda	61	203.
Phofphate of foda	39	91.
Carbonate of foda	51	86.

TABLE *of Deliquefcent Salts*. (Cadet de Vaux).

288 grains of	in days	abforbed
Acetite of potafs	146	700
Muriate of lime	124	684
——— manganefe	105	629
Nitrate of manganefe	89	527
——— zinc	124	495
——— lime	147	448
Muriate of magnefia	139	441
Nitrate of copper	128	397
Muriate of antimony	124	388
——— alumina	149	342
Nitrate of alumina	147	300
Muriate of zinc	76	294
Nitrate of foda	137	257
——— magnefia	73	207
Acetite of alumina	104	202
Super-fulphate of alumina	121	202
Muriate of bifmuth	114	174
Super-phofphate of lime	93	165
Muriate of copper	119	148

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. 2. 3. Mortars of metal, marble, and earthen ware, with their reſpectives peſtles.

Fig. 4. A levigating ſtone and muller.

a. The table of poliſhed porphyry or other ſiliceous ſtone.

b. The muller of the ſame ſubſtance.

Fig. 5. A compound ſieve.

a. The lid.

c. The body containing the ſieve.

b. The receiver.

Fig. 6. A funnel.

Fig. 7. A hooked glaſs rod. Several of which may be hung round the edge of the funnel, to prevent the filtering ſubſtances from adhering too cloſely to its ſides.

Fig. 8. A compound ſyphon.

a. b. c. The ſyphon.

f. g. The mouth piece.

d. e. A board for ſupporting it.

When we inſert the upper orifice *a.* into any liquid, and cloſ the lower orifice *c.* with the finger, by ſucking through *f.* the fluid will riſe from *a.* to *b.* and proceed by *g.* towards *f.* As ſoon as it has paſſed *g.* the finger is to be removed, and the fluid will immediately flow through *c.* and continue flowing as long as any remains above the orifice *a.* It is abſolutely neceſſary that the point *g.* where the mouth-piece joins the ſyphon, be lower than *a.*

Fig. 9. A board perforated with holes for ſupporting funnels.

Fig. 10. A ſeparatory. The fluids to be ſeparated are introduced through the orifice A, which is then cloſed with a ſtopper. The one neck is then to be ſhut with the finger, and the phial is to be inclined to the other ſide. As ſoon as the fluids have ſeparated by means of their ſpecific gravity, the finger is to be removed, and the whole of the heavier fluid will run through the lower neck, before any of the lighter eſcapes.

Fig. 11, and 12. Glaſs graduated meaſures. 11. A cylindrical one for large, 12. A conical one for ſmall, quantities.

Fig. 13. A phial of a particular ſhape for keeping laudanum.

Fig. 14. External view of Dr. Black's furnace.

a. The body.

b. The aſh-pit.

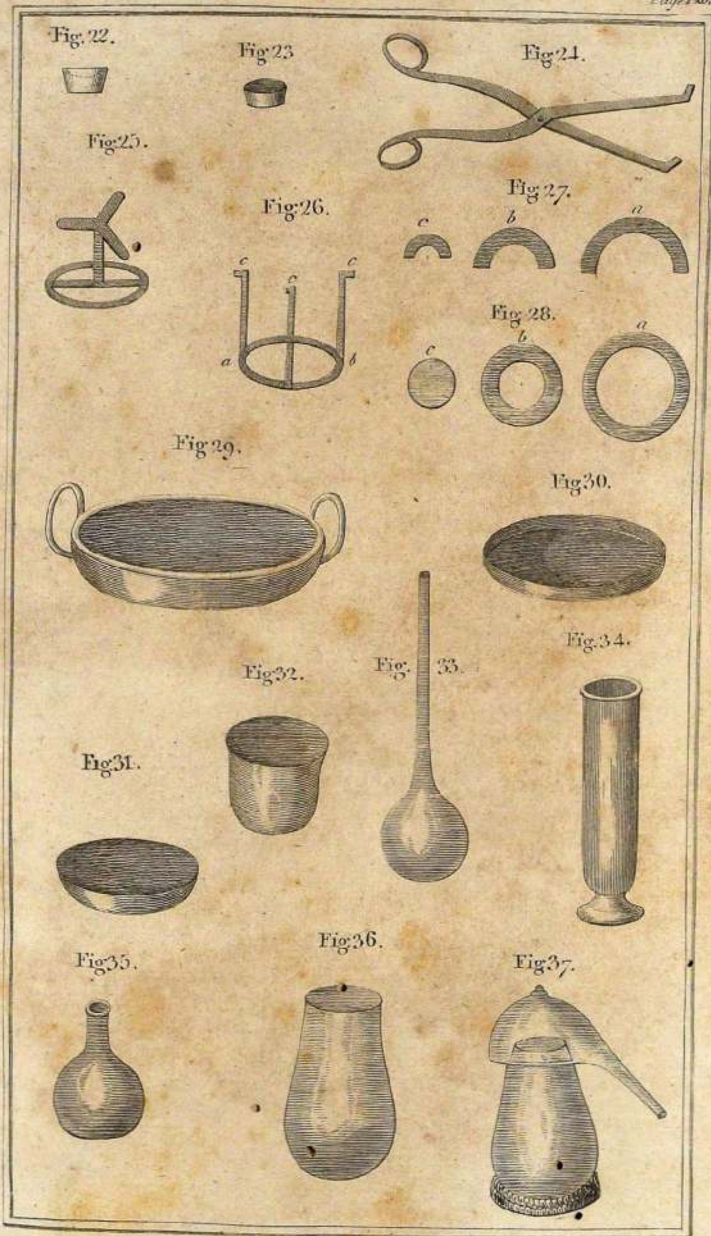
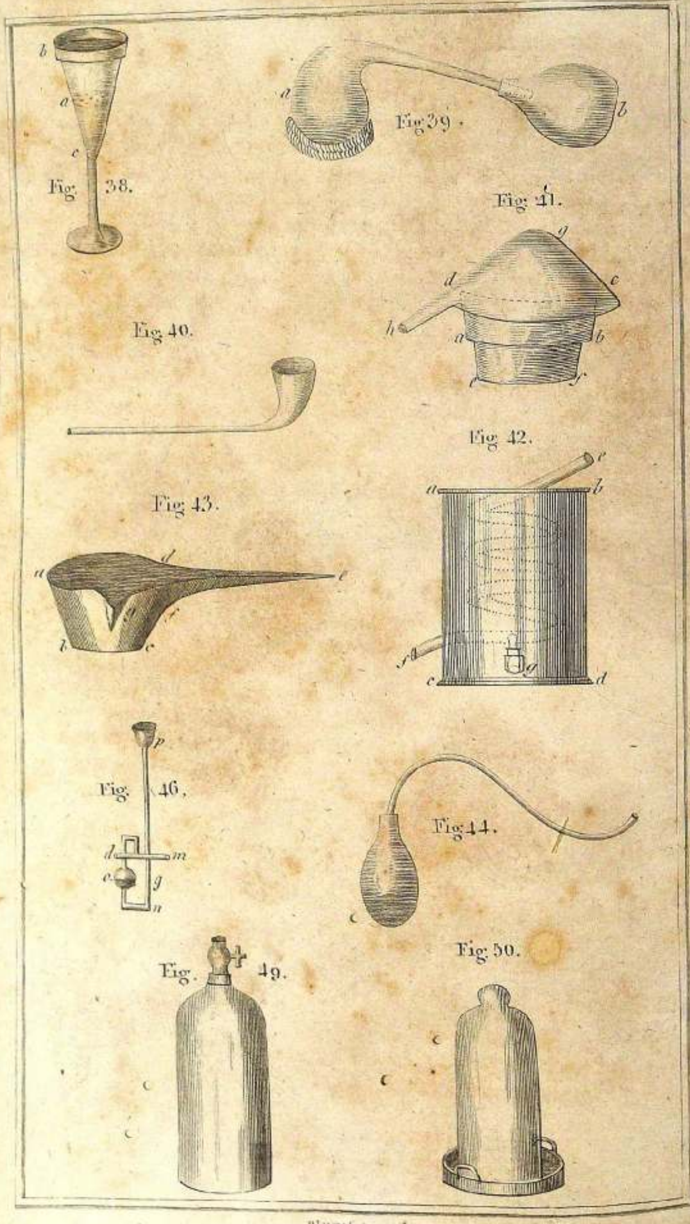


Fig. 22.
Fig. 23
Fig. 24.
Fig. 25.
Fig. 26.
c
c
c
a
b
Fig. 27.
c
b
a
Fig. 28.
c
b
a
Fig. 29.
Fig. 30.
Fig. 31.
Fig. 32.
Fig. 33.
Fig. 34.
Fig. 35.
Fig. 36.
Fig. 37.



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c. The chimney.

d. The circular hole for receiving the ſand-pot.

e. A door about the centre of the body, to be opened when the furnace is uſed as a reverberatory. In Dr. Black's furnace, there is properly no aperture in the ſide, and indeed as its peculiar excellence conſiſts in the power which it gives the operator of regulating the quantity of air admitted to the fuel, and by that means of regulating the intenſity of the fire; every aperture is rather to be conſidered as an injury than as an improvement; and at all times when they are not employed, they muſt be accurately cloſed and luted up.

f. The door of the aſh-pit.

g. The damping plate for regulating the admiſſion of air, having ſix holes, fitted with ſtoppers, increaſing in ſize in a geometrical ratio.

Fig. 15. A vertical ſection of the body of the ſame furnace, to ſhew the manner of luting, and the form and poſition of the grate.

a.——*g.* As in the former figure, except the damping plate, which is here cloſed by a ſliding door with a graduated ſcale.

h. The form which is given to the lute of clay and charcoal which is applied next to the iron.

i. The form given to the lute of ſand and clay, with which the former is lined.

e. Is a ſemicircular aperture left unluted, to ſerve as a door when neceſſary. On other occaſions it is filled up with a ſemi-cylindrical piece of fire-brick, Fig. 16. accurately luted in.

k. The grate faſtened on the outſide of the body.

Fig. 16. A ſemi-cylindrical piece of fire-brick, for cloſing the door *e.* of the furnace.

Fig. 17. The ſand-pot, which is ſuſpended in the aperture *d.* of the furnace, by means of the projecting ring *a. b.*

Fig. 18. A muffle, *a. a.* apertures in its ſides for the admiſſion of the heated air.

Fig. 19. A large black-lead crucible.

Fig. 20. A ſmall Heſſian crucible.

Fig. 21. 22. Teſts.

Fig. 23. A ſmall ſupport of clay, to raiſe the crucible above the grate.

Fig. 24. A pair of crucible tongs.

Fig. 25. A ſupport for raiſing the muffle as high as the door *e.* of the furnace.

Fig. 26. A ring for ſuſpending a retort within the furnace,

when we wiſh to expoſe it to the immediate action of the fire. The ring itſelf, *a. b.* is ſuſpended within the aperture *d.* of the furnace, by means of the three hooked branches, *c. c. c.*

Fig. 27. Semicircular rings of plate-iron, for applying round the neck of a retort when ſuſpended within the furnace, in order to cloſe as much as poſſible the aperture *d.* Fig. 1, The largeſt pair *a.* are firſt made to reſt upon the edge of the aperture *d.* the next pair *b.* upon them, and ſo until they come in contact with the neck of the retort. The whole are then to be covered with aſhes or ſand, to prevent the loſs of heat, and the eſcape of vapours, from the burning fuel.

Fig. 28. Circular rings *a. b.* to be applied in the ſame manner when we wiſh to evaporate with the naked fire. We muſt always take care that the fluid riſes higher than the portion of the evaporating veſſel introduced within the aperture of the ring; *c.* a circular piece of iron, which, when applied with the rings *a. b.* completely cloſes the aperture *d.* of the furnace.

Fig. 29. 30. 31. 32. Evaporating veſſels of different ſhapes.

Fig. 33. A long-necked matraſs.

Fig. 34. A jar.

Fig. 35. A phial or receiver.

Fig. 36. A cucurbit.

Fig. 37. A cucurbit with its capital.

Fig. 38. The arrangement of the apparatus for diſtilling *per deſcenſum*. The ſubſtance to be diſtilled is laid on the metallic plate *a.* which is perforated with holes. The burning fuel is laid upon the upper plate *b.* alſo of metal, but not perforated. On the application of heat the vapour deſcends into the cavity *a. c.* where it is condenſed.

Fig. 39. A retort and receiver; *a.* the retort; *b.* the receiver.

Fig. 40. A retort funnel.

Fig. 41. A metallic ſtill.

c. d. e. f. The body.

a. b. e. f. The lower portion of the body, which hangs within the aperture *d.* of the furnace, by the projecting part *a. b.*

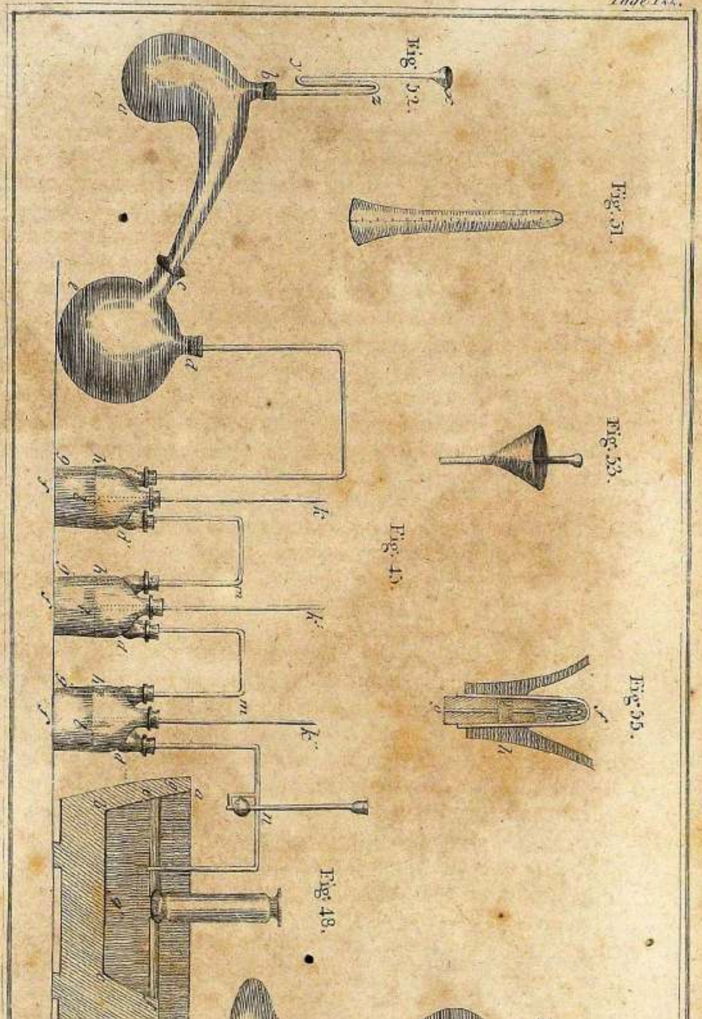
d. g. c. The head of the ſtill.

d. c. A gutter which goes round the bottom of the head, for conveying any vapours which may be condenſed there, into the ſpout *h.* which conveys away the vapour and the fluid condenſed in the head into the refrigeratory.

Fig 42. A refrigeratory.

a. b. c. d. A cylindrical veſſel filled with cold water.

e. f. A ſpiral metallic pipe which paſſes through it. The ſpout *h.* of the ſtill is inſerted within the upper orifice *e*; therefore the vapours which eſcape from the head of the



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ſtill enter it, and are condenſed in their paſſage towards *f.* ths lower termination of the pipe from which the diſtilled fluid runs, and is received into proper veſſels. As the water in the veſſel *a. b. c. d.* continually abſtracts caloric from the vapours, it is apt to become too warm to condenſe them. As ſoon, therefore, as any ſteam eſcapes by the ſpout *f.* the water muſt be drawn off by the cock *g.* and its place ſupplied by cold water.

Fig. 43. A veſſel for boiling inflammable fluids.

a. b. c. d. The body of the kettle.

d. e. f. A long ſpout proceeding from it, for preventing any riſk of boiling over.

g. A ſhort ſpout for pouring out. The veſſel ſhould not be filled above *h. f.* and the long ſpout *d. e f* ſhould be placed ſo as to be as little heated as poſſible. When the fluid begins to ſwell and boil up, both from the great increaſe of ſurface, and from part of it running up the cooler ſpout *d. e. f.* the ebullition will be checked, and all danger of running over be prevented.

Fig. 44. A body with a bent tube.

a. b. The body.

b. c. A ſigmoid tube accurately ground to it. When any permanently elaſtic fluid is generated within the body *a. b.* it eſcapes by the extremity of the tube, and may be collected by introducing it under a jar filled with water or mercury in the pneumatic ciſtern. This ſimple apparatus can only be uſed conveniently when the production of the gas is not rapid, or requires the application of heat.

Fig. 45. A Woulfe's apparatus.

a. b. c. c. d. e. A tubulated retort and receiver.

f. f.' f." Three three-necked bottles. The firſt, *f.* is commonly filled with water, and the two others with alkaline ſolutions.

d. g. d.' g.' d." g." d.'" g.'" Bent tubes connecting the different parts of the apparatus, ſo that when any vapour eſcapes from the receiver *c. d. e.* it paſſes along the tube *d. g.* and riſes through the fluid contained in the bottle *f.* where it remains in contact with the ſurface, and under conſiderable preſſure, until the expanſion of the vapour, not condenſible in *f.* overcomes the column of fluid *h. g.'* in the bottle *f.'* and eſcapes into the upper part of *f.'* In the ſame manner the uncondenſed vapours proceed to *f."* and at laſt to the pneumatic apparatus.

But, as in proceſſes of this kind, diminution of temperature and other cauſes, frequently produce ſudden condenſations of the gaſes, contained in the different parts of the apparatus, eſpecially in the

retort and receiver, any ſuch occurrence would cauſe the fluids to move through the connecting tubes in a retrograde direction. This accident is prevented, by inſerting through the third neck of each bottle a ſmall tube *k. l.* having its lower extremity *l.* immerſed in the fluid contained in the bottle. By this contrivance no fluid can poſſibly paſs from one bottle into another, becauſe the columns *g. m.* &c. which reſiſt the abſorption, are much higher than the columns *h. l.* which oppoſe the admiſſion of external air. While, on the contrary, no gas can eſcape through theſe tubes, becauſe the columns *h. k.* which oppoſe their eſcape, are higher than the columns *g. h.* which reſiſt its progreſs to the next bottle. From their uſe, theſe tubes have got the name of Tubes of Safety.

Another contrivance for the ſame purpoſe, the invention of C. Welter, ſeems now to be much uſed in France. It is fixed to the connecting tubes as at *n.*

Fig. 46. To explain it more fully, we have given a ſeparate view, taken in an oblique direction. When the apparatus is adjuſted, a ſmall quantity of water is poured through the funnel *p.* until it riſes to about the centre of the ball *o.* Now, on any abſorption taking place, the fluid riſes in the ball *o.* until the column *g. n.* be annihilated, when a quantity of air will immediately ruſh in through *p. g. n. o.* &c. and the water will regain its former equilibrium. On the other hand, no gas can eſcape by this tube, becauſe the whole fluid contained in the ball and tube muſt previouſly enter the portion of the tube *n. p.* where it would form a column of ſuch a height that its preſſure could not be overcome.

Fig. 47. A vertical ſection of a pneumatic ciſtern.

a. b. c. d. The whole cavity of the ciſtern.

e. f. A ſhelf for holding the jars.

e. b. c. The well for filling the jars.

g. h. The ſurface of the fluid contained in the ciſtern, which muſt always be higher than the ſurface of the ſhelf.

Fig. 48. 49. 50. 51. Pneumatic jars of different ſhapes.

Fig. 48. A jar in the ſituation in which it is filled with gas.

Fig. 49. A jar fitted with a ſtop-cock.

Fig. 50. A jar placed upon a tray for removing it from the pneumatic ciſtern.

Fig. 51. A graduated jar, commonly called an Eudiometer.

Fig. 52. A hydroſtatic funnel, for pouring fluids gradually into air-tight veſſels, eſpecially when attended with the formation of gas. It is evident, that any portion of fluid, poured into the funnel *x.* more than ſufficient to fill the two firſt parts of the bent tube up to the level *z.* will eſcape by the lower extremity *b.* At the ſame time, no gas can return through this funnel, unleſs its

preſſure be able to overcome the reſiſtance of a column of fluid of the height of *x. y.*

Fig. 53. Another contrivance for the ſame purpoſe. It conſiſts of a common funnel, in the throat of which is inſerted a rod with a conical point, which regulates the paſſage of the fluid through the funnel, according to the firmneſs with which it is ſcrewed in.

54. Nooth's apparatus for promoting the abſorption of gaſeous fluids by liquids. It conſiſts of three principal pieces; a lower piece, *a. b.* a middle piece, *a. c.* and an upper piece, *d. c. e*; all of which are accurately ground to each other. The ſubſtances from which the gas is to be extricated are put into the lower piece. The middle piece is filled with the fluid with which the gas is to be combined; and the upper piece is left empty. As ſoon as a ſufficient quantity of gas is formed to overcome the preſſure, it paſſes through the valve *f. g.* and riſes through the fluid to the upper part of the middle piece. At the ſame time it forces a quantity of fluid into the upper piece through its lower aperture *d.* As ſoon as ſo much of the fluid has been forced from the middle piece as to bring its ſurface down to the level of the lower aperture of the upper piece, a portion of gas eſcapes into the upper piece, and the fluid riſes a little in the middle piece. The upper piece is cloſed with a conical ſtopper *e.* which yields, and permits the eſcape of a portion of gas, as ſoon as its preſſure in the upper piece becomes conſiderable. *h.* Is a glaſs cock for drawing off the fluid.

Fig. 55. The valve of Nooth's apparatus. It conſiſt of an internal tube *g.* of ſmall caliber, but pretty ſtout in ſubſtance, and ground into an external tube *f.* cloſed at the upper end, but perforated with ſmall holes, to allow the gas to paſs. After the internal tube is fitted to the external, a portion of it is cut out as at *h.* ſufficient to receive a ſmall hemiſphere of glaſs, and to ao w the hemiſphere to riſe a little in its chamber, but not to turn over in it. The upper piece of the internal tube is then thruſt home into the place where it is to remain, and the glaſs hemiſphere introduced with its plane recumbent on the upper end of the lower piece of the tube, which is ground perfectly flat, as is alſo the plane of the hemiſphere. From this conſtruction it is evident, that by the upward preſſure of any gas, the glaſs hemiſphere may be raiſed ſo as to allow it to paſs, while nothing can paſs downwards; for the ſtronger the preſſure from above, the cloſer does the valve become. We have been more particular in our deſcription of this valve, becauſe it has been very ingeniouſly applied to diſtilling apparatuſes by Mr. Pepys *junior* and Mr. Burkit.

Chemical Signs.

It is unneceſſary here to point out the advantages which might reſult from a well-contrived ſyſtem of chemical ſigns. About the ſame time that the French chemiſts introduced their methodical nomenclature, they alſo propoſed a correſponding ſyſtem of chemical ſigns, which they intended ſhould ſpeak a language to be underſtood by the learned of all nations. In our explanation of their ſyſtem, we ſhall nearly follow what Mr. Chenevix has ſaid in his judicious remarks upon chemical nomenclature.

There are ſix ſimple radical ſigns, which may be conſidered as ſo many genera.

The firſt genus is the zig-zag line, and is uſed to denote light. See Plate VI, No. 1.

The ſecond genus is the ſtraight line. It comprehends three ſpecies, characterized by its direction.

Sp. 1. A perpendicular line denotes caloric, 3.

Sp. 2. A horizontal line denotes oxygen, 2.

Sp. 3. An oblique line from right to left, nitrogen, 4.

The third genus is a creſcent, which is the generic ſign of ſimple combuſtibles.

Sp. 1. With the horns inclined to the right, carbon, 5.

Sp. 2. The reverſe of the former, hydrogen, 6.

Sp. 3. With the points upwards, ſulphur, 7.

Sp. 4. The reverſe of the latter, phoſphorus, 8.

The fourth genus is a triangle. It comprehends the ſimple ſalifiable baſes.

Sp. 1. With the point upwards, and the baſe horizontal, 9, the alkalies.

Sp. 2. With the point downwards, 10, the earths.

Each of the ſpecies of this genus comprehends ſeveral individuals, which are diſtinguiſhed by inſerting within the triangle the firſt letter of its name in the Latin language; or if two ſpecies begin with the ſame letter, the firſt letter of the ſecond ſyllable is added: thus; for potaſs, P; ſoda, S; baryta, B; ſtrontia, St; lime, C; magneſia, M; glucina, Gc; gadolina, Gd; or Y, for yttria; alumina, Al; zirconia, Z; ſilica, Sl.

The fifth genus is a circle, 11. It comprehends the metals; and the ſpecies are diſtinguiſhed in the ſame manner as the former, by inſerting within it the primary letters of the firſt and ſecond ſyllables: thus; for gold, Ar; platinum, Pt; ſilver, Ag; mercury, H; copper, Cp; iron, Fr; lead, Pb; tin, Sn; zinc, Z; antimony, Sb, or At; biſmuth, B; cobalt, Cb; nickel, Nk; manganeſe, Mg; uranium, U; titanium, Tt; tellurium, Tl; chromium, Cm; arſenic, Aſ; molybdenum, Ml; tungſten, Ts; columbium, Cl.

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The ſixth genus is a ſquare. It comprehends all the unknown baſes of the acids, and the baſes of the compound oxides and acids.

Sp. 1. A ſquare with perpendicular ſides, 12. It contains the unknown and compound acidifiable baſes.

Sp. 2. A ſquare with inclined ſides, 13. It contains the compound oxides. The individuals of both ſpecies are diſtinguiſhed as before.

All compound bodies are expreſſed by combinations of theſe ſimple characters. But as ſimple bodies are capable of uniting in various proportions, it becomes neceſſary that theſe proportions ſhould be expreſſed; and relative poſition has appeared the moſt natural method of doing ſo. In general, when the proportion of any body in a compound is ſmall, its ſign is placed above, when large below, as in 35. 36. 42. &c.

Caloric exiſts in all bodies: but according to its relative quantity, they exiſt as ſolids, fluids, or gaſes. To expreſs the firſt ſtate, it has not been thought neceſſary to introduce the ſign of caloric; to expreſs the ſecond, it is placed above; and to expreſs the third, below, as in the examples in the plate (22—32).

Oxygen alſo combines with many bodies, and in ſeveral proportions. The products reſulting from theſe combinations are either oxides or acids. The oxides may be characterized by affixing the ſign of oxygen to the left ſide of the ſign of the baſe, and the acids by affixing it to the right; and the greater or leſs degree of each may be marked by placing it above or below, as in the examples in the plate. In this I have deviated from all the tables of chemical ſigns which I have ſeen, and, I truſt, with propriety; for M. Chenevix has remarked of the ſyſtem, that "one of its chief defects is, the impoſſibility of marking, by any "principles it points out, the difference of the metallic oxides. "A circle, with the mark of oxygen at the top, is the only me- "thod of marking a metallic oxide; for if we put the mark of "oxygen lower, it will then have the force of an acid, and we "muſt not confound the ſituation of the ſigns to mark differ- "ences of ſtates, or the whole ſyſtem will become confuſed." But the alteration propoſed enables us to mark no leſs than ſix ſtates of oxygenizement. When the ſign of oxygen is placed on the left, it implies that the compound is an oxide; if it be placed at top, it expreſſes the ſmalleſt degree of oxidizement; at bottom, the higheſt, and we have room for an intermediate one. The degrees of acidification are expreſſed in the ſame manner, except that the character of oxygen is placed to the right of the baſe. See 14—21. I have ſince found that the ſame propoſal has been made by Dr. Vandier, in the Journ. de Phyſique, vol.

56; and this coincidence is a proof that it is not arbitrary, but arifes naturally from an attentive confideration of the fubject.

The other primary combinations are expreffed in the fame way. When they unite only in one proportion, or when the proportions are indifferent, the figns are placed indifferently, though it would be better to place them in one determinate way; but when either of them is in excefs, its fign is always placed below. Thus heavy hydro-carbonous oxide is expreffed by placing the fign of hydrogen above that of carbon, 36; light hydro-carbonous oxide, by reverfing their pofition, 35. Glafs is expreffed by placing the figns of foda and filica fide by fide, 41; the liquor filicum, by placing the fign of the alkali under that of the earth, and adding the fign of fluidity above, 42.

The fecondary compounds are expreffed in a fimilar manner. The bafis has been generally placed before the acid, to admit of the fign of the degree of acidfication being added to the acid; and the fame pofition fortunately admits of the fign of the degree of oxidizement being added to the oxide, when a metallic oxide forms the bafis of the falt. The excefs of acid or bafe is marked as before, by placing the acid or bafe below. With regard to the metallic falts, Mr. Chenevix has given fome reafons for not introducing the fign of oxygen; but he himfelf has given the moft powerful reafon for introducing it, by proving that the real difference between calomel and corrofive fublimate is in the ftate of oxidizement of the metal. The manner of marking the oxides propofed above, enables us to exprefs this difference diftinctly, when the degree of oxidizement is afcertained.

Explanation of the Table of Chemical Signs.

Generic Signs.

No.				
1. Light.	5. Carbon.	9. Alkalies.	11. Metals.	12. Acidifiable bases, unknown or compound.
2. Oxygen.	6. Hydrogen.	10. Earths.		
3. Caloric.	7. Sulphur.			13. Compound oxides.
4. Nitrogen.	8. Phosphorus.			

Combinations of Oxygen.

No.		Oxides. 1.	2.	3.	Acids. 1.	2.	3.
14.	Nitrogen.	Atmospheric air.	Nitrous oxide.	Nitric oxide.	Nitrous.		Nitric.
15.	Carbon.	Incombustible coal.	Charcoal	Carbonic oxide.			Carbonic.
16.	Hydrogen.			Water.			
17.	Sulphur.			Oxide of sulphur.	Sulphurous.		Sulphuric.
18.	Mercury.	Black oxide.	Yellow.	Red.			
19.	Iron.	Green oxide.		Red.			
20.	Arsenic.			White.			Arsenic.
21.	Muriatic radical.				Muriati	Oxygenized muriatic.	Hyper oxygenized muriatic.

Combinations of Caloric.

22. Oxygen. 23. Nitrogen. 24. Sulphur. 25. Potaſs. 26. Acetic acid. 27. Ice. 28. Ammonia. 29. Sulphuric acid. 30. Mercury. 31. White oxide of arſenic. 32. Acetate of Ammonia. The three columns repreſent the mode of characterizing the three ſtates of aggregation of each of theſe ſubſtances.

Primary Compounds.

33. Ammonia. 34. Carburet of iron. 35. Light hydro-carbonous oxide. 36. Heavy hydro-carbonous oxide. 37. Sulphuretted phoſphorus. 38. Phoſphuretted ſulphur. 39. Amalgam of gold. 40. Alloy of ſilver and copper. 41. Glaſs. 42. Silicized Potaſs.

Secondary Compounds.

43. Sulphite of potaſs. 44. Sulphate of potaſs. 45. Super-ſulphate of potaſs. 46. Sulphate of alumina. 47. Super-ſulphate of alumina and potaſs, alum. 48. Nitrate of potaſs. 49. Muriate of ammonia. 50. Hyper-oxygenized muriate of potaſs. 51. Tartrate of ſoda and potaſs. 52. Sub-borate of ſoda. 53. Sub-muriate of mercury leſs oxidized, calomel. 54. Muriate of mercury more oxidized, corroſive ſublimate. 55. Green ſulphate of iron. 56. Brown ſulphate of iron. 57. Tartrate of antimony and potaſs. 58. Sub-acetate of copper. 59. Acetate of copper. 60. Soap of ſoda. 61. Soap of ammonia. 62. Hydroguretted ſulphuret of potaſs. 63. Litharge plaſter. 64. Ammoniuret of gold. Fulminating gold.

PART II.

MATERIA MEDICA.

EVERY ſubſtance employed in the cure of diſeaſe, whether in its natural ſtate, or after having undergone various preparations, belongs to the Materia Medica, in the extended acceptation of the words. But in moſt pharmacopœias, the materia medica is confined to ſimples, and to thoſe preparations which are not ſuppoſed to be prepared by the apothecary himſelf, but to be purchaſed by him, as articles of commerce, from druggiſts and others.

Syſtematic authors on this branch of medical knowledge have beſtowed much pains in contriving ſcientific arrangements of theſe articles. Some have claſſed them according to their natural reſemblances; others according to their active conſtituent principles; and others according to their real or ſuppoſed virtues. Each of theſe arrangements has its particular advantages. The firſt will probably be preferred by the natural hiſtorian, the ſecond by the chemiſt, and the laſt by the phyſiologiſt. But every ſcientific claſſification hitherto propoſed is liable to numerous objections. Accordingly, in the pharmacopœias publiſhed by the colleges of phyſicians of London, Dublin, and Edinburgh, the articles of the materia medica are arranged in alphabetical order; and the ſame plan is now almoſt univerſally adopted. I ſhall therefore alſo follow it, ſubjoining to the name of each article, admitted by any of the Britiſh colleges, a ſhort view of its natural, medical, and pharmaceutical hiſtory; and in thus forming a dictionary of materia medica, I ſhall generally adopt the nomenclature of the Edinburgh college.

In an appendix, I ſhall give a very conciſe account of ſuch other ſubſtances as, from their poſſeſſing a place in ſome reſpectable foreign pharmacopœias, or from their active properties, ſeem of ſufficient importance to be noticed. But to conjoin with the hiſtory of the materia medica given in alphabetical order the advantages of other methods, I ſhall add ſome of thoſe arrangements which ſeem moſt uſeful.

ACIDUM ACETOSUM. (*Ed.*) *Acetum Vini.* (*Dub.*) *Acetum.* (*Lond.*)

Vinegar. Impure acetous acid.

VINEGAR, as obtained by the fermentation of vinous liquors, besides the pure acetic acid diluted with much water, contains tartaric acid, tartrate of potass, mucilaginous matters, and sometimes phosphoric acid. The least impure is that prepared from white wine. It should be of a pale yellow colour, perfectly transparent, of a pleasant, somewhat pungent, acid taste, but without any acrimony. From the mucilaginous impurities which all vinegars contain, they are apt, on exposure to the air, to become turbid and ropy, and at last vapid. This inconvenience is best obviated by keeping them in bottles completely filled and well corked. They are said to keep better if they are boiled a few minutes before they be corked.

Vinegar is sometimes adulterated with sulphuric acid. Its presence is detected, if, on the addition of a solution of nitrate of baryta to the suspected vinegar, a white precipitate is formed, which is insoluble in nitric acid, after having been burnt in the fire. With the same intention of making the vinegar appear stronger, different acrid vegetables are occasionally infused in it. This fraud is difficult of detection; but when tasted with attention, the pungency of such vinegar will be found to depend rather on acrimony than acidity.

Vinegar possesses strong antiseptic powers on dead animal and vegetable matters. Hence its employment in pickling. The fine green colour, so much admired in some vegetable pickles, is often improperly given them by means of copper. This poisonous addition is easily detected, on dropping some carbonate of ammonia into the suspected vinegar, by the fine blue colour produced.

Medical uses.—Its action on the living body is gently stimulant and astringent. It promotes transpiration and the discharge by urine; and used moderately as a condiment, it facilitates digestion.

Vinegar is employed as a useful addition to drink in inflammatory fevers, in the proportion of about an ounce to a quart. As a medicine, it is used in putrid diseases, in scurvy, and to counteract the effects of narcotic poisons and mephitic vapours. In the form of glyster, it is used in the same diseases, and in obstinate constipation. Externally, it is applied in fomentations and baths, as a stimulant and discutient; and its vapour is inhaled in putrid sore throat, and diffused through the chambers of the sick, to correct the putrescency of the atmosphere.

Officinal preparations.—Acidum acetoſum deſtillatum. *Edin. Lond. Dub.* Acid. acet. aromaticum. *Ed.* Acid. acetoſ. forte. *Ed.* Acid. acet. camphoratum. *Ed.* Syrupus acidi acetoſi. *Ed.* Mel acetat. *Lond. Dub.* Syr. colchici. *Ed.* Oxymel colchici. *Lond.* Oxymel ſcillæ. *Lond.* Oxymel æruginis. *Lond.* Acetum ſcillæ. *Lond. Dub.* Cataplaſ. ſinap. *Lond. Dub.* Cerat. ſaponis. *Lond. Dub.*

ACIDUM SULPHURICUM. *Ed. Acidum vitriolicum.* (Lond. Dub.) *Oleum vitrioli.*

Sulphuric acid, *Vitriolic acid, oil of vitriol.*

THE London and Edinburgh colleges direct, that in the ſhops its ſpecific gravity ſhould be to that of water as 1850 to 1000; the Dublin college as 1845 to 1000. This want of uniformity is to be regretted.

The phyſical and chemical properties of this acid have been already enumerated. As it is prepared by the trading chemiſt, it is inſerted among the materia medica. It is obtained in two ways; by diſtilling off the acid from ſulphate of iron, previouſly deprived of its water of cryſtallization by heat, or by burning ſulphur in large leaden chambers, with an eighth part of nitrate of potaſs to ſupply the neceſſary oxygen. In the firſt way the ſtrongeſt acid is obtained, but it is apt to contain iron or copper. By the ſecond proceſs it generally contains lead, which is eaſily detected by mixing a portion of the acid with three parts of diſtilled water, and if the acid be impure, a depoſition will be formed. It may be rendered perfectly pure by diſtillation, filling a retort half full of the common acid, and diſtilling in a ſand-bath, gradually heated as long as any acid comes over. The receiver ſhould not be luted on.

Sulphuric acid powerfully decompoſes dead animal matter. It becomes diluted with water formed by the union of the hydrogen and oxygen; another portion of the hydrogen combines with the azote to form ammonia, and the carbon is ſeparated in the ſtate of charcoal. The affinities which regulate this action are ſo powerful, that it produces the ſame effects on the living ſolid, and therefore it acts upon them as a corroſive. But to its employment with this view, its fluidity is an objection, as it cannot be eaſily managed.

Medical uſes.—When ſufficiently diluted, it is an excellent tonic, checking fermentation, exciting appetite, promoting digeſtion, and quenching thirſt, and it is therefore uſed with ſucceſs in morbid acidity, weakneſs, and relaxation of the ſtomach. As an aſtringent, it is uſed in hæmorrhagies; and from its refrigerant and antiſeptic properties, it is a valuable medicine in many fe-

brile diseases, especially those called putrid. If taken in any considerable quantity, or for some time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed internally, in psora, and other cutaneous affections. The best mode of prescribing it, is to order the quantity of acid to be used, and to direct it to be mixed with as much water as will render it palatable, to which some syrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose.

Externally it is used as a gargle, particularly in putrid sore throats, and in aphthous mouths, and as a wash in cutaneous eruptions, and ill-conditioned ulcers. Made into an ointment with sixteen times its weight of axunge, it has been used to cure psora.

Off. prep.—Acid. sulph. dilutum, *Ed. Lond. Dub.* Acid. sulph. aromaticum, *Ed.* It is also used in the preparation of acid. nitr. *Ed. Lond. Dub.* Acid muriat. *Ed. Lond. Dub.* Aqua supercarb. potassæ, *Ed.* Sulphas potassæ, *Ed.* Phosphas sodæ, *Ed.* Murias antim. *Ed. Lond. Dub.* Sulphas ferri, *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.* Sub-sulphas hydrarg. flavus, *Ed. Lond. Dub.* Æth. sulph. *Ed. Lond. Dub.*

ACIPENSER. *Pisces Branchiostegi*, Cuvier, Isinglas.

Sp. A. Huso. *Lond.*

The Beluga, or Isinglas fish.

Sp. A. Ruthenus. *Lond.*

The Sterlet, or Caviar-sturgeon.

Officinal—Ichthyocolla, Isinglas.

Besides those mentioned by the London college, isinglas is prepared from other species of Acipenser, especially *A. sturio*, the sturgeon, and *A. stellatus*, the serruga.

The preparation of isinglas is almost peculiar to Russia. It is made in all places where the large species of sturgeon are caught, as on the Dnieper, the Don, and especially on the Caspian sea, also on the Volga, the Ural, the Oby, and the Irtysh. That prepared from the sturgeon is reckoned the best, and next to it, that from the beluga. It also varies, according to the mode of preparation. On the Volga and Ural, the sounds are watered while fresh, and dried to a certain degree. The outer skin is next taken off, and the inner glossy white membrane is twisted into proper shapes, and then completely dried. The best is usually rolled into the form of a snake or heart; the second folded in leaves, like a book; and the worst is dried without any care. In other

places, as at Gurief, fiſh-glue is extracted from the ſounds by boiling. This is cut into flabs or plates, is perfectly tranſparent, and has the colour of amber. On the Okka, where the ſterlet only is to be had, the ſounds are beat juſt as they are extracted from the fiſh, and dried into glue.

Good iſinglas is white, in ſome degree tranſparent, dry, compoſed of membranes, not too thick, and without any ſmell.

The properties of iſinglaſs depend entirely on the gelatin, of which it principally conſiſts. One hundred grains of good iſinglas was found by Mr. Hatchett to contain rather more than ninety-eight of matter ſoluble in water. A nutritious jelly may be prepared from it. A watery ſolution of it is uſed as a teſt of the preſence of tannin, and for the clarification of ſpiritous liquors. Mr. Davy's ſolution for the former purpoſe conſiſts of 120 grains of iſinglas diſſolved in twenty ounces of water; and if properly made, it has a tendency to gelatinize, at temperatures below 50. F.

It is ſaid to be employed for the preparation of Engliſh court-plaſter.

ACONITUM NEOMONTANUM. *Aconitum.* (*Lond. Dub.*) *A. Napellus.* (*Ed.*)

Large Blue Wolfsbane, Monk's-hood, Aconite.

Linnæi ſpecies plantarum, edit. Willdenow, genus 1062, *ſpecies* 9. *Polyandria Trigynia.*—Nat. ord. *Multiſiliquæ.*

Officinal—Herba, (*Lond.*) Folia, (*Ed. Dub.*) The leaves.

THIS, we are aſſured by Willdenow, is the ſpecies of aconite which has always been uſed in medicine; although it is almoſt univerſally known by the name of Aconitum Napellus, in conſequence of a botanical error of Stoerk, who introduced it into practice.

It is a perennial plant, found in the Alpine foreſts of Carinthia, Carniola, and other mountainous countries in Germany, and cultivated in our gardens.

The freſh plant and root are very violent poiſons, producing remarkable debility, paralyſis of the limbs, convulſive motions of the face, bilious vomiting, and catharaſis, vertigo, delirium, aſphyxia, death. The freſh leaves have very little ſmell, but when chewed, have an acrid taſte, and excite lancinating pains, and ſwelling of the tongue. By drying, its acrimony is almoſt entirely deſtroyed. For medical uſe, the plant muſt be gathered before the ſtem ſhoots.

Uſes and doſe.—When properly adminiſtered, it acts as a penetrating ſtimulus, and generally excites ſweat, and ſometimes an increaſed diſcharge of urine.

On many occaſions, it has been found a very effectual remedy

in glandular ſwellings, venereal nodes, anchyloſis, ſpina ventoſa, itch, amauroſis, gouty and rheumatic pains, intermittent fevers, and convulſive diſorders.

We may begin by giving one or two grains of the dried leaves in powder; but it is commonly uſed in the form of an inſpiſſated juice. As ſoon as the plant is gathered, the juice is expreſſed, and evaporated without any previous clarification, to the conſiſtence of an extract. It is an unfortunate circumſtance, that the powers of this medicine vary very much, according to its age, and the heat employed in its preparation. When recently prepared, its action is often too violent; and when kept more than a year, it becomes totally inert. It may therefore be laid down as a univerſal rule, in the employment of this and of many other ſimilar active medicines, to begin with very ſmall doſes, and to increaſe them gradually to the neceſſary degree; and whenever we have occaſion to begin a new parcel of the medicine, we ſhould again commence with the ſmalleſt doſe, and proceed with the ſame caution as at firſt.

We may begin by giving half a grain of this extract, either formed into a powder with ten grains of white ſugar, or made up with any convenient addition into a pill, twice or thrice a-day, and gradually increaſe the doſe: or a tincture of aconite may be prepared, by digeſting one part of the dried leaves in ſix parts of ſpirit of wine; the doſe of which will be at firſt five or ten drops, and may be gradually increaſed to forty.

Off. prep.—Succus ſpiſſatus aconiti napelli, (*Ed.*)

ACORUS CALAMUS. (*Edin.*) *Calamus aromaticus*. (*Lond. Dub.*)

Sweet flag.

Willd. g. 663, *ſp.* 1.—*Hexandria Monogynia*.—Nat. ord. *Piperitæ*.

Off.—Radix. The root.

This plant is perennial, and grows plentifully in rivulets and marſhy places about Norwich, and other parts of England, in the canals of Holland, in Switzerland, and in other countries of Europe. The ſhops have been uſually ſupplied from the Levant with dried roots, which do not appear to be ſuperior to thoſe of our own growth.

The root of acorus is full of joints, crooked, ſomewhat flatted on the ſides, internally of a white colour, and looſe ſpongy texture; its ſmell is ſtrong; the taſte warm, acrid, bitteriſh, and aromatic; both the ſmell and taſte are improved by exſiccation. This root is generally looked upon as a carminative and ſtomachic medicine, and as ſuch is ſometimes made uſe of in practice. It is ſaid by ſome, though erroneouſly, to be ſuperior in aromatic fla-

vour to any other vegetable that is produced in these northern climes. It is, nevertheless, a sufficiently elegant aromatic. The fresh root candied is said to be employed at Constantinople as a preservative against epidemic diseases. The leaves of this plant have a sweet fragrant smell, more agreeable, though weaker, than that of the roots.

Neumann obtained by distillation about two scruples of fragrant volatile oil from sixteen ounces of the dried root. It also rose in distillation with water, but not with alcohol. The spiritous extract from two ounces weighed 370 grains, and water extracted from the residuum, 190 grains. The watery extract from two ounces weighed 455 grains, and the residuum gave out to alcohol 43.

ÆSCULUS HIPPOCASTANUM. (*Ed*) *Hippocastanum.* Horse chesnut.

Willd. g. 717, *sp.* 1. *Heptandria Monogynia.*—Nat. ord. *Trihilatæ.*

Officinal—Semen, cortex. The seed and bark.

This is a very common and well-known tree. The fruit, which probably contains much amylaceous matter, has been used as food for domestic animals, and even for men, in times of scarcity. But its introduction into the Edinburgh Pharmacopœia was probably owing to its having been used and recommended as a sternutatory in some cases of ophthalmia and headach. With this view it was drawn up the nostrils, in the form of an infusion or decoction.

The bark has been proposed as an indigenous substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhous fever, and also when applied externally in gangrene, sufficiently warrant future trials. Although chemical analysis is not yet sufficiently advanced, to enable us to determine from it the medical use of any substance, I may observe, that the active constituent of this bark is tannin, which is scarcely compatible with the presence of cinchonin, the predominant, and probably the active, constituent of Peruvian bark. In powder, it may be given to the extent of a scruple and a half, or a drachm, for a dose. Buchholz prefers a solution of a drachm of the extract in an ounce of cinnamon water, of which sixty drops are to be given every three hours.

ALCOHOL. (*Ed.*) *Spiritus vinosus rectificatus.* (*Lond.*) *Spiritus vini rectificatus.* (*Dub.*)

Alcohol, rectified spirit of wine.

The spirit distilled from wine, or other fermented liquors per-

fectly free from any unpleaſant ſmell, and of which the ſpecific gravity is to that of water as 835 to 1000, ſuch as may be eaſily procured. (*Ed.*) The London college order a ſpirit of the ſame ſpecific gravity, and add, that it contains 95 parts of pure alcohol, and five of water. The Dublin college order it of the ſpecific gravity 840.

Alcohol forms the true characteriſtic of vinous liquors, and ariſes from the decompoſition of ſugar, being always in proportion to its quantity. It is found in greateſt quantity in the wines of warm countries, and in wines prepared from thoroughly ripened fruit. In the ſouth of France, ſome wines yield a third of brandy. It is the proportion of alcohol which renders wines more or leſs generous, and prevents them from becoming ſour. The richer a wine is in alcohol, the leſs malic acid it contains; and therefore the beſt wines give the beſt brandy, becauſe they are free from the diſagreeable taſte which the malic acid imparts to them. Old wines give better brandy than new wines, but leſs of it.

Alcohol is procured from wine by diſtillation; in conducting which, the following rules are to be obſerved:

1. To heat the whole maſs of fluid at once, and equally.
2. To remove all obſtacles to the aſcent of the vapour.
3. To condenſe the vapour as quickly as poſſible.

The diſtillation is continued until the liquor which comes over is not inflammable.

Baumé mentions a very remarkable fact concerning the preparation of alcohol. He diſtilled two pounds of alcohol, ſpecific gravity 832, in the water bath, and filled the refrigeratory with ice, and he obtained two pounds four ounces of an alcohol having only ſpecific gravity 862. This he aſcribes to water condenſed from the air in the worm by the coldneſs of the ice; and he aſſures us, from experience, that to get an alcohol of 827, it is abſolutely neceſſary that the refrigeratory be filled with water of 145° F.

Diſtillers judge of the ſtrength of their ſpirits by the ſize and durability of the bubbles it forms, when poured from one veſſel into another, or in agitating it in a veſſel partly filled. Another proof is, by the combuſtion of gunpowder: ſome of which is put in a ſpoon; it is then covered with the ſpirit to be tried, which is ſet on fire; if it kindle the gunpowder, it is ſuppoſed to be ſtrong, and *vice verſa*. But a ſmall quantity of ſpirits will always kindle gunpowder, and a large quantity never. Another proof is by the carbonate of potaſs, which attracts the water, and diſſolves in it, while the alcohol ſwims above. But all theſe are

uncertain; and dependence can only be put in the proof by hydrometers, or ſome ſuch contrivance, for aſcertaining the weight of a given quantity at a given temperature.

In this country, alcohol is procured from an infuſion of malt, and before its rectification is termed Whiſky. In the Eaſt-Indies, arrack is diſtilled from rice; in the Weſt-Indies, rum from the ſugar-cane; and in France and Spain, brandy from wine. Of all theſe, the French brandy is the fineſt ſpirit; for the others are more or leſs impregnated with eſſential oils, of which it is almoſt impoſſible to free them entirely. When any ardent ſpirit is re-diſtilled to procure alcohol, the water-bath is commonly uſed, which gives a more equal and temperate heat, and improves the product. Gren ſays, that the addition of four pounds of well-burnt charcoal, and three or four ounces of ſulphuric acid, previous to this rectification, deſtroys entirely the peculiar taſte of malt ſpirit; and that a ſecond rectification with one pound of charcoal, and two ounces of ſulphuric acid, affords an alcohol of very great purity. But the affinity of alcohol for water is ſo very ſtrong, that it cannot be obtained entirely free from it by ſimple diſtillation. We muſt, therefore, abſtract the water by means of ſome ſubſtance which has a ſtronger affinity for it than alcohol has. Carbonate of potaſs was formerly employed; but muriate of lime is preferable, becauſe its affinity for water is not only very great, but by being ſoluble in alcohol, it comes in contact with every particle of the fluid. For this purpoſe, one part of muriate of lime, rendered perfectly dry by having been expoſed to a red heat, and powdered after it becomes cold, is put into the ſtill. Over this, three parts of highly rectified ſpirits are to be poured, and the mixture well agitated. By diſtillation with a very gentle heat, about two-thirds of the ſpirit will be obtained in the ſtate of perfectly pure alcohol.

The chemical properties of alcohol have been already mentioned.

Medical uſes.—On the living body alcohol acts as a moſt violent ſtimulus. It coagulates all the albuminous and gelatinous fluids, and corrugates all the ſolids. Applied externally, it ſtrengthens the veſſels, and thus may reſtrain paſſive hæmorrhagies. It inſtantly contracts the extremities of the nerves it touches, and deprives them of ſenſe and motion; by this means eaſing them of pain, but at the ſame time deſtroying their uſe. Hence employing ſpiritous liquors in fomentations, notwithſtanding the ſpecious titles of vivifying, heating, reſtoring mobility, reſolving, diſſipating, and the like, uſually attributed to them, may ſometimes be attended with unhappy conſequences. Theſe liquors received undiluted into the ſtomach, produce the ſame effects, contracting all the ſolid parts which they touch, and deſtroying, at leaſt for a time,

their uſe and office; if the quantity be conſiderable, a palſy or apoplexy follows, which ends in death. Taken in ſmall quantity, and duly diluted, they act as a cordial and tonic: if farther continued, the ſenſes are diſordered, voluntary motion deſtroyed, and at length the ſame inconveniencies brought on as before. Vinous ſpirits, therefore, in ſmall doſes, and properly diluted, may be applied to uſeful purpoſes in the cure of diſeaſes; whilſt in larger ones they produce the moſt deleterious effects.

Off. prep.—Alcohol, *Lond. Dub.* Alcohol ammoniat. *Ed.* Æther ſulph. *Ed. Lond. Dub.* Æth. ſulph. cum alcohole, *Ed. Lond. Dub.* Oleum vini, *Lond.* Spiritus æth. nitroſ. *Ed. Lond. Dub.* It alſo enters into the preparation of all tinctures and diſtilled ſpirits, and is uſed undiluted in Tinct. aſſæ fœtid. *Ed. Lond. Dub.* T. Balſami Peruviani, *Lond.* T. Benzoes comp. *Lond. Ed.* T. Camph. *Ed. Lond. Dub.* T. Guaiaci, *Ed.* T. Moſche, *Dub.* T. Myrrhæ, *Dub.* T. Saponis, *Ed.* T. Toluiferæ balſam, *Ed. Lond. Dub.* Spt. Lavand. *Ed. Lond. Dub.* Spt. Roriſmar. *Ed. Lond.*

ALCOHOL DILUTUM. (*Ed.*) *Spiritus vinoſus tenuior.* (*Lond.*) *Spiritus vini tenuior.* (*Dub.*)

Diluted alcohol. Spirit of wine. Proof ſpirit.

ALCOHOL mixed with an equal quantity of water, being ſomewhat weaker than proof ſpirit; its ſpecific gravity is to that of diſtilled water as 935 to 1000. (*Ed.*) The London and Dublin colleges order it of the ſpecific gravity of 930, which, according to the former, contains 55 parts of pure alcohol, and 45 of water.

Although it be deſirable that diluted alcohol ſhould always be prepared, by mixing rectified ſpirit with water, inſtead of employing an impure ſpirit of the requiſite ſtrength, it is hardly to be expected that apothecaries will either be at the trouble or expence. The diluted alcohol of the Edinburgh college is ſomewhat weaker than that of the other two colleges; but beſides that it is more convenient for their mode of preparing it, this will be attended with no diſadvantage, as it is ſtill ſufficiently ſtrong for any purpoſe to which it may be applied.

Officinal preparations.—Alcohol ammon. *Lond. Dub.* and all the tinctures and diſtilled ſpirits, except thoſe made with alcohol. It is alſo uſed, ſomewhat extravagantly, in the preparation of various extracts.

TABLE of the Specific Gravities according to Gilpin, and degrees according to Baumé's hydrometer, of various mixtures of Alcohol and Water, and in Clarke's hydrometer, used by the revenue.

WATER.	ALCOHOL.	SPECIFIC GRAVITIES. 60°	55°	BAUME. 55°
0	100	.825	.82736	38
10	100	.84568	.84802	34+
20	100	.86208	.86441	30—
30	100	.87569	.87796	29+
40	100	.88720	.88945	27+
50	100	.89707	.89933	25+
60	100	.90549	.90768	23—
70	100	.91287	.91502	22
80	100	.91933	.92145	21—
90	100	.92499	.92707	20—
100	100	.93002	.93208	19—
100	90	.93493	.93696	19+
100	80	.94018	.94213	18
100	70	.94579	.94767	17—
100	60	.95181	.95357	16—
100	50	.95804	.95966	16+
100	40	.96437	.96575	15+
100	30	.97074	.97181	14+
100	20	.97771	.97847	13+
100	10	.98654	.98702	12+
100	0	1.		10

SP. GR. 60°	CLARKE.
833	Spirit of wine.
858	1 to 2
881	1 to 3
891	1 to 4
896	1 to 5
900	1 to 6
904	1 to 7
907	1 to 8
909	1 to 9
910	1 to 10
913	1 to 15
916	1 to 20
920	Proof.
926	1 in 20
928	1 in 15
932	1 in 10
933	1 in 9
934	1 in 8
936	1 in 7
938	1 in 6
942	1 in 5
945	1 in 4
954	1 in 3
964	1 in 2

ALLIUM.

Willd. g. 626.—*Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

Sp. 14. ALLIUM SATIVUM. (*Ed. Lond. Dub.*)

Garlic.

Off.—Radix. The root.

THE garlic is a perennial bulbous-rooted plant, which grows wild in Sicily, and is cultivated in our gardens. The root consists of five or six small bulbs, called *cloves*, inclosed in one common membranous coat, but easily separable from each other. All the parts of this plant, but more especially the roots, have a strong offensive, very penetrating and diffusible, smell, and an acrimonious, almost caustic, taste. The root is full of a limpid juice, of which it furnishes almost a fourth part of its weight by expression. It also loses about half its weight by drying, but

ſcarcely any of its ſmell or taſte. By decoction its virtues are entirely deſtroyed; and by diſtillation it furniſhes a ſmall quantity of a yellowiſh eſſential oil, heavier than water, which poſſeſſes the ſenſible qualities of the garlic in an eminent degree. Its peculiar virtues are alſo in ſome degree extracted by alcohol and acetous acid.

By Newmann's analyſis, it loſt two thirds of its weight by exſiccation. By decoction from 960 parts, water extracted 380, and the reſiduum yielded 27 to alcohol, and was reduced to 40. Alcohol applied firſt, extracted 123, the reſiduum yielded 162 to water, and was reduced to 40. In both caſes the alcoholic extract was unctuous and tenacious, and precipitated metallic ſolutions. But the active ingredient was a thick ropy eſſential oil, according to Hagen heavier than water, not amounting to more than 1·3 of the whole, in which alone reſided the ſmell, the taſte, and all that diſtinguiſhes the garlic.

Medical uſe.—Applied externally, it acts ſucceſſively as a ſtimulant, rubefacient, and bliſter. Internally, from its very powerful and diffuſible ſtimulus, it is often uſeful in diſeaſes of languid circulation and interrupted ſecretion. Hence, in cold leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, ſudorific; it has alſo been by ſome ſuppoſed to be emmenagogue. For the ſame reaſon, in caſes in which a phlogiſtic diatheſis, or other irritability prevails, large doſes of it may be very hurtful.

It is ſometimes uſed by the lower claſſes as a condiment, and alſo enters as an ingredient into many of the epicure's moſt favourite ſauces. Taken in moderation, it promotes digeſtion; but in exceſs, it is apt to produce headach, flatulence, thirſt, febrile heat, and inflammatory diſeaſes, and ſometimes occaſions a diſcharge of blood from the hæmorrhoidal veſſels.

In fevers of the typhoid type, and even in the plague itſelf, its virtues have been much celebrated.

Garlic has been ſaid to have ſometimes ſucceeded in curing obſtinate quartans, after cinchona had failed. In catarrhal diſorders of the breaſt; aſthma, both pituitous and ſpaſmodic; flatulent colics; hyſterical and other diſeaſes, proceeding from laxity of the ſolids, it has generally good effects: it has likewiſe been found ſerviceable in ſome hydropic caſes. Sydenham relates, that he has known the dropſy cured by the uſe of garlic alone; he recommends it chiefly as a warm ſtrengthening medicine in the beginning of the diſeaſe.

It is much recommended by ſome as an anthelmintic, and has been frequently applied with ſucceſs externally as a ſtimulant to indolent tumours, in caſes of deafneſs proceeding from atony or rheumatiſm, and in retention of urine, ariſing from debility of the bladder.

Garlic may either be exhibited in ſubſtance, and in this way ſeveral cloves may be taken at a time without inconvenience, or the cloves cut into ſlices may be ſwallowed without chewing. This is the common mode of exhibiting it for the cure of intermittents.

The expreſſed juice, when given internally, muſt be rendered as palatable as poſſible, by the addition of ſugar and lemon juice. In deafneſs, cotton moiſtened with the juice is introduced within the ear, and the application renewed five or ſix times in one day.

Infuſions in ſpirit, wine, vinegar, and water, although containing the whole of its virtues, are ſo acrimonious, as to be unfit for general uſe; and yet an infuſion of an ounce of bruiſed garlic in a pound of milk, was the mode in which Roſenſtein exhibited it to children afflicted with worms.

But by far the moſt commodious form for adminiſtering garlic, is that of a pill or bolus conjoined with ſome powder, correſponding with the intention of giving the garlic. In dropſy, calomel forms a moſt uſeful addition. It may alſo ſometimes be exhibited with advantage in the form of a clyſter.

Garlic made into an ointment with oils, &c. and applied externally, is ſaid to reſolve and diſcuſs indolent tumours, and has been by ſome greatly eſteemed in cutaneous diſeaſes. It has likewiſe ſometimes been employed as a repellent. When applied under the form of a poultice to the pubis, it has ſometimes proved effectual in producing a diſcharge of urine, when retention has ariſen from a want of due action in the bladder. Sydenham aſſures us, that among all the ſubſtances which occaſion a derivation or revulſion from the head, none operates more powerfully than garlic applied to the ſoles of the feet: he was led to make uſe of it in the confluent ſmall-pox, about the eighth day, after the face began to ſwell, the root cut in pieces, and tied in a linen cloth, was applied to the ſoles, and renewed once a-day till all danger was over.

Sp. 43. Allium Cepa. *Cepa.* • (*Dub.*)
Onion.
Officinal—Radix. The root.

This is alſo a perennial bulbous-rooted plant. The root is a ſimple bulb, formed of concentric circles. It poſſeſſes in general the ſame properties as the garlic, but in a much weaker degree. Neumann extracted from 480 parts of the dry root, by means of alcohol, 360, and then by water 30; by water applied firſt 395, and then by alcohol, 30: the firſt reſiduum weighed 56, and the ſecond 64. By diſtillation the whole flavour of the onions paſſed over, but no oil could be obtained.

Medical uses.—Onions are considered rather as an article of food than of medicine: they are supposed to yield little or no nourishment, and when eaten liberally produce flatulencies, occasion thirst, headachs, and turbulent dreams; in cold phlegmatic habits, where viscid mucus abounds, they doubtless have their use; as by their stimulating quality they tend to excite appetite, and promote the secretions: by some they are strongly recommended in suppressions of urine, and in dropsies. The chief medicinal use of onions in the present practice is in external applications, as a cataplasm for suppurating tumours, &c.

ALOE PERFOLIATA. (*Ed.*)
Willd. g. 659. sp. 3.—Hexandria Monogynia.—Nat. ord. *Liliaceæ.*

A perennial plant, of which there are many varieties which grow in the south of Europe, Asia, Africa, and America. But Thunberg says, that the finest aloes are prepared from the *Aloe spicata*, the second species of Willdenow, which grows at the Cape of Good Hope.

During four years that the Cape of Good Hope was in possession of the British, more than 300,000 pounds, the produce of that settlement, were imported into England; and as this quantity was infinitely greater than could be required for the purposes of medicine, it is not improbable, that, as Mr. Barrow states, its principal consumption was by the London porter brewers.

1. Aloe Socotorina. *Lond. Ed. Dub.*
Socotorine aloes.
Officinal.—Gummi-resina. The gum-resin.

This article is brought, wrapt in skins, from the island of Socotora in the Indian ocean. This sort is the purest of the three in use: it is of a glossy surface, clear, and in some degree pellucid: in the lump, of a yellowish red colour, with a purple cast; when reduced to powder, of a bright golden colour. It is hard and friable in the winter, somewhat pliable in summer, and grows soft between the fingers. Its taste is bitter, accompanied with an aromatic flavour, but insufficient to prevent its being disagreeable; the smell is not very unpleasant, and somewhat resembles that of myrrh.

It is prepared by pulling off the leaves in July, from which the juice is expressed, and afterwards boiled and skimmed. It is then preserved in skins, and dried in August in the sun. According to others, the leaves are cut off close to the stem and hung up. The

juice which drops from them without any expreſſion, is afterwards dried in the ſun.

2. Barbadoes, or Hepatic Aloes.

Hepatic aloes is not ſo clear and bright as the foregoing ſort; it is alſo of a darker colour, more compact texture, and for the moſt part drier. Its ſmell is much ſtronger and more diſagreeable; the taſte intenſely bitter and nauſeous, with little or nothing of the fine aromatic flavour of the ſocotorine. The beſt hepatic aloes comes from Barbadoes in large gourd ſhells, and an inferior ſort of it, which is generally ſoft and clammy, is brought over in caſks. In Barbadoes the plant is pulled up by the roots, and carefully cleaned from the earth and other impurities. It is then ſliced into ſmall hand-baſkets and nets, which are put into large iron boilers or cauldrons with water, and boiled for ten minutes, when they are taken out, and freſh parcels ſupplied till the liquor is ſtrong and black, which is then ſtrained into a deep vat, narrow at bottom, where it is left to cool and to depoſit its feculent parts. Next day the clear liquor is drawn off by a cock, and again committed to a large iron veſſel. At firſt it is boiled briſkly, but towards the end it is ſlowly evaporated, and requires conſtant ſtirring to prevent burning. When it becomes of the conſiſtence of honey, it is poured into gourds or calabaſhes for ſale, and hardens by age.

3. Fetid, Caballine, or Horse, Aloes.

This ſort is eaſily diſtinguiſhed from both the foregoing, by its ſtrong rank ſmell; although, in other reſpects, it agrees pretty much with the hepatic, and is not unfrequently ſold in its ſtead. Sometimes the caballine aloes is prepared ſo pure and bright, as not to be diſtinguiſhable by the eye even from the ſocotorine; but its offenſive ſmell, of which it cannot be diveſted, readily betrays it. It is now excluded from the liſt of almoſt all modern pharmacopœias, and is employed ſolely by farriers.

From ſixteen ounces of aloes Neumann extracted near fifteen by means of alcohol. From the reſiduum water took up one drachm, about an ounce of impurities being left; on inverting the procedure and applying water firſt, he obtained but thirteen ounces and a half of watery extract, and from the reſiduum alcohol diſſolved an ounce and a half. According to this analyſis, 1000 parts of aloes contains about 78 ſoluble in water only, or analagous to

gum, 980 ſoluble in alcohol only, or reſinous, and 895 ſoluble both in alcohol and in water, or extractive. The conſtituent principles of aloes therefore appear to be reſin and extractive. Dr. Lewis alſo remarks that decoctions of aloes let fall a precipitate, as they cool, probably from extractive being more ſoluble in boiling than in cold water. He alſo proved the hepatic aloes to contain more reſin and leſs extractive than the ſocotorine, and this leſs than the caballine. The reſins of all the ſorts, purified by alcohol, have little ſmell; that obtained from the ſocotorine has ſcarce any perceptible taſte; that of the hepatic, a ſlight bitteriſh reliſh; and the reſin of the caballine, a little mor of the aloetic flavour. The extractive obtained ſeparately from any of the kinds, is leſs diſagreeable than the crude aloes: the extractive of ſocotorine aloes has very little ſmell, and is in taſte not unpleaſant; that of the hepatic has a ſomewhat ſtronger ſmell, but is rather more agreeable in taſte than the extract of the ſocotorine: the extractive of the caballine retains a conſiderable ſhare of the peculiar rank ſmell of this ſort of aloes, but its taſte is not much more unpleaſant than that of the extractive obtained from the two other ſorts.

Medical uſe.—Aloes is a bitter ſtimulating purgative, exerting its action chiefly on the rectum. In doſes of from 5 to 15 grains it empties the large inteſtines, without making the ſtools thin; and likewiſe warms the habit, quickens the circulation, and promotes the uterine and hæmorrhoidal fluxes. If given in ſo large a doſe as to purge effectually, it often occaſions an irritation about the anus, and ſometimes a diſcharge of blood.

It is frequently employed in caſes of ſuppreſſion of the menſes, or of the hæmorrhoidal diſcharge; but it is particularly ſerviceable in habitual coſtiveneſs, to perſons of a phlegmatic temperament and ſedentary life, and where the ſtomach is oppreſſed and weakened. It has, however, a tendency to induce and augment hæmorrhoidal affections; and with thoſe who are liable to ſuch complaints, it ſhould be avoided. In dry bilious habits aloes proves injurious, immoderately heating the body, and inflaming the bowels.

Some are of opinion, that the purgative virtue of aloes reſides entirely in its reſin; but experience has ſhewn, that the pure reſin has little or no purgative quality, and that the extractive part ſeparated from the reſinous, acts more powerfully than the crude aloes. If the aloes indeed be made to undergo long coction in the preparation of the gummy extract, its cathartic power will be conſiderably leſſened, not from the ſeparation of the reſin, but from an alteration made in the extractive itſelf by the action of the heat and air. The ſtrongeſt vegetable cathartics become mild by a like treatment.

Socotorine aloes, as already obſerved, contains more extractive

than the hepatic; and hence is likewife found to purge more, and with greater irritation. The firft fort, therefore, is moft proper where a ftimulus is required, as for promoting or exciting the menftrual flux; whilft the latter is better calculated to act as a common purge.

Aloes are adminiftered either

a. Simply,[1] or
b. In compofition:
  1. With purgatives. Soap, fcammony, colocynth, rhubarb.
  2. With aromatics. Canella.
  3. With bitters. Gentian.
  4. With emmenagogues. Iron, myrrh.

They are exhibited in the form of

a. Powder; too naufeous for general ufe.
b. Pill; the moft convenient form.
c. Solution in wine or diluted alcohol.

Off. prep. Pulv. cum canella, *Lond.*—cum Guaiaco, *Lond.*—cum ferro, *Lond.*—Pil. Scam. comp. cum aloe, *Lond.* Pilulæ, *Ed. Lond. Dub.*—cum affa fœt. *Ed.*—cum colocynth, *Ed.*—cum myrrha, *Lond. Ed.* Pil. rhoei comp. *Ed.* Extract, *Dub.* Extract coloc. comp. *Lond.* Tinct. *Ed. Lond. Dub.*—cum myrrha, *Ed.* Tinct. benz. comp. *Lond. Ed.* T. rhei cum aloë, A. *Ed.* T. A. æther, *Ed.* Vinum, *Ed. Lond. Dub.*

ALTHÆA OFFICINALIS. (*Ed.*) *Althæa. Lond.*

Marfh-mallow.

Wild. g. 1289. *fp.* 1.—*Monadelphia Polyandria.*—Nat. ord. *Columnaceæ.*

Off. Radix. Folium. The root and leaves.

THE marfh-mallow is a perennial indigenous plant, which is found commonly on the banks of rivers, and in falt marfhes.

The whole plant, but efpecially the root, abounds with mucilage. The roots are about the thicknefs of a finger, long and fibrous. They are peeled and dried, and then are perfectly white.

From 960 parts of the dry root, Neumann extracted by water 650, and afterwards with alcohol 41; by alcohol applied firft 360, and afterwards by water 348. Lewis extracted by alcohol only 120, and he obferved that the alcoholic extract was fweeter than the watery, and had the fmell peculiar to the root. The fubftance foluble in this inftance, both in alcohol and water, is probably faccharine. From 960 parts of the dry leaves Neumann

extracted by water 340, and then by alcohol 213; by alcohol first 280, and then by water 218. The residuum of the root was only one fourth of the leaves, one half of the whole. The root is therefore the most mucilaginous. The decoction of the root reddens turnsol, and gelatinizes silicized potass.

Med. use.—It is used as an emollient and demulcent, in diseases attended with irritation and pain, as in various pulmonary complaints, and in affections of the alimentary canal and urinary organs; and it is applied externally in emollient fomentations, gargles, and clysters.

Off. prep. Decoct. *Ed.* Syr. *Ed. Lond.*

AMMONIACUM. *Gummi-resina. Lond. Dub. Ed.*
Ammoniacum, a gum-resin.

AMMONIACUM is a concrete, gummy-resinous juice, brought from the East Indies, usually in large masses, composed of little lumps or tears, of a milky colour, but soon changing, upon being exposed to the air, to a yellowish hue. We have no certain account of the plant which affords this juice; it is said to grow in Nubia, Abyssinia, and the interior of Egypt; the seeds usually found among the tears resemble those of the umbelliferous class, and it is not improbable that it is an exudation from a species of ferula. Such tears as are large, dry, free from little stones, seeds, or other impurities, should be picked out and preferred for internal use; the coarser kind is purified by solution, colature, and careful inspissation; but unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts. There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue.

Ammoniacum has a nauseous sweet taste, followed by a bitter one; and a peculiar smell, somewhat like that of galbanum, but more grateful: it softens in the mouth, and grows of a white colour upon being chewed. It softens by heat, but is not fusible; when thrown upon live coals, it burns away in flame; it is in some degree soluble in water and in vinegar, with which it assumes the appearance of milk; but the resinous part, amounting to about one half, subsides on standing.

Neumann extracted from 480 parts, 360 by alcohol, and then by water 105; by water applied first 410, and then by alcohol 60. Alcohol distilled from it arose unchanged, but water acquired a sweetish taste, and the smell of the ammoniac. The solution in alcohol is transparent; but on the addition of water, becomes milky. It therefore seems to consist principally of a substance soluble both in water and in alcohol, combined with some volatile matter.

Medical uſe.—The general action of gum-ammoniac is ſtimulant. On many occaſions, in doſes of from ten to thirty grains, it proves a valuable antiſpaſmodic, deobſtruent, or expectorant. In large doſes it purges gently, excites perſpiration, and increaſes the flow of urine. It is uſed with advantage to promote expectoration, in ſome pulmonary diſeaſes; in dropſical affections, to augment the flow of urine, and to ſupport the ſalivation in ſmall pox. It is alſo an uſeful deobſtruent; and is frequently preſcribed for removing obſtructions of the abdominal viſcera, and in hyſterical diſorders, occaſioned by a deficiency of the menſtrual evacuations. In long and obſtinate colics, proceeding from viſcid matter lodged in the inteſtines, this gummy reſin has produced happy effects after purges and the common carminatives had been uſed in vain. Externally, it is ſuppoſed to ſoften and ripen hard tumours. A ſolution of it in vinegar has been recommended by ſome for reſolving even ſcirrhous ſwellings.

It is exhibited internally,

a. In ſolution, combined with vinegar, vinegar of ſquills, aſſa fœtida, &c.

b. In pills, with bitter extracts, myrrh, aſſa fœtida.

c. And externally, combined with vinegar, turpentine, common plaſter, &c.

Off. prep.—Ammon. purif. *Lond.* Lac am. *Lond. Dub.* Pil. ſcill. *Ed. Lond. Dub.* Emp. gum. *Ed.* Empl. A. cum hydrarg. *Lond.*

AMOMUM.

Willd. g. 4.—*Monandria Monogynia.*—Nat. ord. *Scitamineæ.*

Sp. 1. AMOMUM ZINGIBER, *Ed.* *Zingiber, Lond. Dub.*

Ginger.

Off.—Radix ſiccata. Radix condita ex India allata. The dried root, and the preſerved root brought from India.

GINGER is a perennial plant, indigenous in the Eaſt Indies, but now cultivated in the Weſt-India iſlands. It is cultivated there very much in the ſame manner as potatoes are here, and is fit for digging once a-year, unleſs for preſerving in ſyrup, when it ſhould be dug at the end of three or four months, at which time it is tender and full of ſap.

Ginger is diſtinguiſhed into two ſorts, the black and the white. The former is rendered fit for preſervation by means of boiling water, the latter by inſolation; and as it is neceſſary to ſelect the faireſt and roundeſt ſorts for expoſure to the ſun, white ginger is commonly one third dearer than black.

Black ginger conſiſts of thick and knotty roots, internally of an

orange or browniſh colour, externally of a yellow-grey. White ginger is leſs thick and knotty, internally of a reddiſh-yellow, and externally of a whitiſh-grey or yellow. It is firm and reſinous, and more pungent than the black. Pieces which are worm-eaten, light, friable, or ſoft, and very fibrous, are to be rejected.

Candied ginger ſhould be prepared in India, from the young and ſucculent roots. When genuine, it is almoſt tranſparent. That manufactured in Europe is opaque and fibrous.

Ginger has a fragrant ſmell, and a hot, biting, aromatic taſte. Neumann obtained by diſtillation with water from 7680 parts of white ginger, about 60 of a volatile oil, having the ſmell and diſtinguiſhing flavour of the ginger, but none of its pungency. The watery extract was conſiderably pungent, and amounted to 2720, after which alcohol extracted 192 of a very pungent reſin. Alcohol applied firſt extracted 660 of pungent reſin, and water afterwards 2160 of a mucilaginous extract, with little taſte, and difficultly exſiccated. The black ginger contained leſs ſoluble matter than the white.

Medical uſe.—Ginger is a very uſeful ſpice in cold flatulent colics, and in laxity and debility of the inteſtines; it does not heat ſo much as thoſe of the pepper kind, but its effects are more durable. It may alſo be applied externally as a rubefacient.

Off. prep.—Syr. *Ed.* Tinct. *Lond.* It is alſo an ingredient in pulv. arom. *Lond. Dub. Ed.* Pulv. ſcam. comp. *Lond. Dub.* Pulv. ſcam. cum aloe, *Lond.* Pulv. ſennæ comp. *Lond.* Elect. arom. *Dub.* Elect. ſcammon. *Lond. Dub.* Confectio opiat. *Lond.* Troch. magneſ. *Lond.* Pil. aloet. *Dub.* Pil. ſcill. *Lond. Dub.* Infuſ. ſennæ, *Lond. Dub.* Syr. ſpin. cerv. *Lond.* Tinct. cinnam. comp. *Lond. Dub.* Vin. aloes, *Ed.* Acid. ſulph. aromat. *Ed.*

Sp. 3. Amomum Zedoaria. *Dub.*
Long Zedoary.
Off.—Radix. The root.

The zedoary is perrenial, and grows in Ceylon and Malabar. The roots come to us in pieces, ſome inches in length, and about a finger thick. Externally they are wrinkled, and of an aſh-grey colour, but internally are browniſh-red. The beſt kind comes from Ceylon, and ſhould be firm, heavy, of a dark colour within, and neither worm-eaten nor very fibrous. It has an agreeably fragrant ſmell, and a warm, bitteriſh, aromatic taſte.

In diſtillation with water, it yields a volatile oil, heavier than water, poſſeſſing the ſmell and flavour of the zedoary in an eminent degree; the remaining decoction is almoſt ſimply bitter. Spirit likewiſe brings over ſome ſmall ſhare of its flavour: nevertheleſs, the ſpiritous extract is conſiderably more grateful than the zedoary itſelf. From 7680 parts Neumann got 2720 of watery

extract, and afterwards 140 of almost insipid resin; by applying alcohol first, 720, and water afterwards, 2400, much bitterer than the original watery extract.

Off. prep.—Confect. aromat. *Lond.*

Sp. 7. AMOMUM CARDAMOMUM. *Cardamomum Minus. Dub.*
Sp. 10. ——— REPENS. *Ed* *Cardamomum Minus. Lond.*
Lesser Cardamom seeds.
Off.—Semen.

The London and Edinburgh colleges, on the authority of Sonnerat, have supposed these seeds to be the product of the latter species, while the Dublin college, with Murray, Willdenow, and all the foreign pharmaceutical writers, ascribe them to the former. Both species are natives of India.

Cardamom seeds are a very warm, grateful, pungent aromatic, and frequently employed as such in practice: they are said to have this advantage, that, notwithstanding their pungency, they do not, like those of the pepper kind, immoderately heat or inflame the bowels. Both water and rectified spirit extract their virtues by infusion, and elevate them in distillation; with this difference, that the tincture and distilled spirit are considerably more grateful than the infusion and distilled water: the watery infusion appears turbid and mucilaginous, the tincture limpid and transparent. From 480 parts Neumann got about 20 of volatile oil, 15 of resinous extract, and 45 of watery. The husks of the seeds, which have very little smell or taste, may be commodiously separated, by committing the whole to the mortar, when the seeds will readily pulverize, so as to be freed from the shell by the sieve: this should not be done till just before using them; for if kept without the husks, they soon lose considerably of their flavour.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct, sennæ, *Lond. Dub.* Tinct. gent. comp. *Lond.* Tinct. cinnam. comp. *Ed. Lond. Dub.* Tinct. rhei, *Ed. Lond.* Tinct. rhei cum aloe, *Ed.* Vin. aloes, *Ed.* Vin. rhab. *Lond.* Extr. coloc. comp. *Lond.* Pulv. arom. *Ed. Lond. Dub.* Confect. aromat. *Lond.* Pil. scill. *Ed.*

AMYGDALUS COMMUNIS. *Ed.*
a. *Amygdalus dulcis. Ed.* *Amygdalæ dulces. Lond. Dub.*
b. *Amygdala amaræ. Lond.*
Off.—Nucleus. The kernel. The almond tree.
Willd. g. 981, *sp.* 2. *Icosandria Monogynia*—Nat. ord. *Pomaceæ.*

THE fruit which affords those kernels is the produce of a tree nearly resembling the peach. It originally came from Syria and Barbary, but is now much cultivated in the south of Europe.

The eye diſtinguiſhes no difference betwixt the trees which produce the ſweet and bitter, or betwixt the kernels themſelves; it is ſaid that the ſame tree has, by a difference in culture, afforded both.

The almond is a flattiſh kernel, of a white colour, and of a ſoft ſweet taſte, or a diſagreeable bitter one. The ſkins of both ſorts are thin, browniſh, unpleaſant, and covered with an acrid powdery ſubſtance. They are very apt to become rancid on keeping, and to be preyed on by a kind of inſect, which eats out the internal part, leaving the almond to appearance entire. To theſe circumſtances regard ought to be had in the choice of them.

Sweet almonds are of greater uſe in food than as medicine, but they are reckoned to afford little nouriſhment; and when eaten in ſubſtance, are not eaſy of digeſtion, unleſs thoroughly comminuted. They are ſuppoſed, on account of their unctuous quality, to obtund acrimonious juices in the primæ viæ: peeled ſweet almonds, eaten ſix or eight at a time, ſometimes give preſent relief in the heartburn.

Bitter almonds have been found poiſonous to dogs and ſome other animals; and a water diſtilled from them, when made of a certain degree of ſtrength, has had the ſame effects. Nevertheleſs, when eaten, they appear innocent to moſt men, and are every day uſed in cookery, on account of their agreeable flavour; but there are ſome habits, in which the ſmalleſt quantity produces urticaria, and other unpleaſant ſymptoms. The ſimilarity of the ſmell of bitter almonds to pruſſic acid, led Mr. Schrader to ſuppoſe, that it was owing to the preſence of this acid: and it is ſaid that he has found his ſuppoſition correct; and that pruſſic acid is equally poiſonous with the bitter diſtilled waters.

Both ſorts of almonds yield, on expreſſion, a large quantity of oil, which ſeparates likewiſe, upon boiling the almonds in water, and is gradually collected on the ſurface.

The oils obtained by expreſſion from both ſorts of almonds are in their ſenſible qualities the ſame. They ſhould be perfectly free from ſmell and taſte, and poſſeſs the other properties of fixed oils

Medical uſe.—The general virtues of theſe oils are, to blunt acrimonious humours, and to ſoften and relax the ſolids: hence their uſe internally, in tickling coughs, heat of urine, pains and inflammations; and externally, in tenſion and rigidity of particular parts. On triturating almonds with water, the oil and water unite together, by the mediation of the other matter of the kernel, and form an unctuous milky liquor.

The milky ſolutions of almonds in watery liquors, commonly called emulſions, contain the oil of the ſubject, and participate in ſome degree of its emollient virtue; but have this advantage

above the pure oil, that they may be given in acute or inflammatory diforders, without danger of the ill effects which the oil might fometimes produce; fince emulfions do not turn rancid or acrimonious by heat, as all the oils of this kind in a little time do. As the bitter almond imparts its peculiar tafte when treated in this way, the fweet almonds are employed in making emulfions.

Several unctuous and refinous fubftances, of themfelves not mifcible with water, may, by trituration with almonds, be eafily mixed with it into the form of an emulfion; and are thus excellently fitted for medicinal ufe. In this form camphor, and the refinous purgatives, may be commodioufly taken.

Off. prep.—Oleum fixum, *Ed. Lond. Dub.* Emulfio, *Ed. Lond. Dub.* Emulfio arab. *Ed. Dub.* Emulfio camph. *Ed. Lond.*

AMYRIS.

Willd. g. 755. *Octandria Monogynia.*—Nat. ord. *Dumofæ.*

Sp. 2. Amyris Elemifera. *Elemi. Lond. Dub.*

Elemi. A refin.

Off.—Refina. The refin.

The tree which furnifhes elemi grows in Carolina and Spanifh America. In dry weather, and efpecially at full moon, incifions are made in the bark, from which a refinous juice flows, and is left to harden in the fun. It is brought to us in long roundifh cakes, generally wrapped up in flag leaves. The beft fort is foftifh, fomewhat tranfparent, of a pale whitifh yellow colour, inclining a little to green, of a ftrong, not unpleafant fmell, refembling fomewhat that of fennel. Dr. Wright fays, that on wounding the burfera gummifera, a thick milky liquor flows, which foon concretes into a refin no way different from the elemi of the fhops. Of one hundred parts ninety-four diffolve in alcohol, and part of its fragrance rifes along with this menftruum in diftillation: diftilled with water it yields 6.4 of pale-coloured, thin, fragrant, effential oil: its only conftituents, therefore, are refin and effential oil. It gives name to one of the officinal unguents, and is at prefent fcarce any otherwife made ufe of; though it is certainly preferable for internal purpofes to fome others which are held in greater efteem.

Off. prep.—Ungt. elemi, *Lond. Dub.*

Sp. 18. Amyris Zeylanica.

The elemi which comes from the Eaft-Indies is faid to be the produce of this fpecies.

Sp. 6. AMYRIS GILEADENSIS.

Off.—Reſina liquida. *Ed.* Balſamum Gileadenſe. Balſam of Gilead. A liquid reſin.

THIS article, which has alſo had the name of Balſamum Judaicum, Syriacum, de Mecca, Opo-balſamum, &c. is a reſinous juice, obtained from an evergreen tree, growing ſpontaneouſly, particularly near to Mecca, on the Aſiatic ſide of the Red ſea. The true opo-balſamum, according to Alpinus, is at firſt turbid and white, of a very ſtrong pungent ſmell, like that of turpentine, but much ſweeter; and of a bitter, acrid, aſtringent taſte: upon being kept for ſome time, it becomes thin, limpid, of a greeniſh hue, then of a gold yellow, and at length of the colour of honey.

This balſam is in high eſteem among the eaſtern nations, both as a medicine, and as an odoriferous unguent and coſmetic. But in Europe it is never obtained genuine; and as all the ſigns of its goodneſs are fallacious, it has been very rarely employed. Nor need we regret it; for any of the other reſinous fluids, ſuch as the balſam of Canada or Capaiba, will anſwer every purpoſe full as well.

The dried berries of this tree were formerly kept under the title of Carpo-balſamum, and the dried twigs under that of Xylo-balſamum. Although Willdenow has inſerted the amyris opo-balſamum as a diſtinct ſpecies, he thinks they are the ſame.

ANAS ANSER. *Adeps Anſerinus. Dub.*

The gooſe. The fat.

THE ſpecific properties of the different kinds of fat are now very generally diſbelieved: and therefore almoſt the only kinds in uſe are thoſe of the domeſtic animals, which are eaſily procured. Gooſe fat is ſoft and very greaſy. It is very rarely uſed in medicine, as it poſſeſſes no advantage over axunge.

ANCHUSA TINCTORIA. *Ed. Anchuſa. Dub.*

Alkanet.

Off.—Radix. The root.

Willd. g. 277. *ſp.* 7. *Pentandria Monogynia.*—Nat. ord. *Aſperifoliæ*

THIS plant is a native of Europe: it is ſometimes cultivated in our gardens; but the greateſt quantities are raiſed in Germany or France, particularly about Montpelier, from whence the dried roots are uſually imported to us. The alkanet root produced in England is much inferior in colour to that brought from abroad; the Engliſh being only lightly reddiſh, the others of a deep purp-

lish red; and it has been suspected, but without sufficient foundation, that the foreign roots owe part of their colour to art. The cortical part of the root is of a dusky red, and imparts an elegant deep red to alcohol, oils, wax, and all unctuous substances, but not to watery liquors.

Alkanet root has little or no smell; when recent, it has a bitterish astringent taste, but when dried scarcely any. As to its virtues, the present practice expects not any from it. Its chief use is for colouring oils, ointments, and plasters. As the colour is confined to the cortical part, the small roots are best, having proportionally more bark than the large.

ANETHUM.

Willd. g. 560. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Sp. 1. ANETHUM GRAVEOLENS. *Lond.*

Dill.

Off.—Semen. The seed.

DILL is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatic, but not of the most agreeable kind. The seeds are recommended as a carminative in flatulent colics. The most efficacious preparations of them are the distilled oil, and a tincture or extract made with rectified spirit.

Off. prep.—Aq. dist. *Lond.*

Sp. 3. ANETHUM FOENICULUM. *Ed.* *Fœniculum dulce. Lond. Dub.*

Sweet fennel.

Off. Semen. The root and seeds.

THIS is a biennial plant, of which there are four varieties. One of these, the common fennel, is indigenous to England. The sweet fennel, the variety which is officinal, grows wild in Italy, but is also cultivated in our gardens. It is smaller in all its parts than the common, except the seeds, which are considerably larger. The seeds of the two sorts differ likewise in shape and colour. Those of the common are roundish, oblong, flattish on one side, and protuberant on the other, of a dark almost blakish colour; those of the sweet are longer, narrower, not so flat, generally crooked, and of a whitish or pale yellowish colour.

The seeds of both the fennels have an aromatic smell, and a moderately warm pungent taste: those of the *fœniculum dulce* are in flavour most agreeable, and have also a considerable degree of sweetness.

From 960 parts, Neumann obtained 20 of volatile oil, 260 watery extract, and afterwards some alcoholic extract, which could not be exsiccated, on account of its oiliness. By alcohol first he got 84 resinous extract, 120 fixed oil, and then by water 120 of a bitter extract.

Off. prep.—Aqua dest. semin. *Lond. Dub.* Oleum volat. semin. *Dub.* O. v. flor. *Dub.* Decoct. cham. *Dub.*

ANGELICA ARCHANGELICA. *Ed. Angelica. Lond. Dub.* Angelica.

Off.—Radix, caulis, folium, semen. The root, stalk, leaves, and seeds.

Willd. g. 543. *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

ANGELICA is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in Alpine countries; but for the use of the shops, it is cultivated in gardens in different parts of Europe.

All the parts of Angelica, especially the roots, have a fragrant aromatic smell; and a pleasant bitterish warm taste, glowing upon the lips and palate for a long time after they have been chewed. The flavour of the seeds and leaves is very perishable, particularly that of the latter, which, on being barely dried, lose the greatest part of their taste and smell: the roots are more tenacious of their flavour, though they lose part of it with keeping. The fresh root, wounded early in the spring, yields an odorous yellow juice, which, slowly exsiccated, proves an elegant gummy resin, very rich in the virtues of the angelica. On drying the root, this juice concretes into distinct moleculæ, which, on cutting it longitudinally, appear distributed in little veins; in this state, they are extracted by alcohol, but not by watery liquors. Angelica roots are apt to grow mouldy, and to be preyed on by insects, unless thoroughly dried, kept in a dry place, and frequently aired. We apprehend, that the roots which are subject to this inconvenience, might be preserved, by dipping them in boiling spirit, or exposing them to its steam, after they are dried. Baumé says, that it is only the roots gathered in the spring that are subject to this inconvenience, and that when gathered in the autumn, they keep good several years. Roots only worm-eaten are as fit as ever for making a tincture, or affording volatile oil.

Angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice. The root, which is the most efficacious part, is used in the aromatic tincture. The stalks make an agreeable sweetmeat.

Off. prep.—Spirit anisi comp. *Lond.*

ANGUSTURA. *Cortex. Ed. Dub.*

The natural hiſtory of this bark is but imperfectly known. The firſt parcel of it was imported from Dominica in July 1788, with an account, "that it had been found ſuperior to the Peruvian "bark in the cure of fevers." Subſequent importations from the Spaniſh Weſt Indies, either immediately or through the medium of Spain, render it probable that it is the produce of South America; and I have ſomewhere read that Humboldt, in his late travels in South America, diſcovered it to be the produce of a ſpecies of cinchona: we may now, therefore, expect to get further information reſpecting its natural hiſtory.

Its appearance varies, accordingly, as it has been taken from larger or ſmaller branches. The outer ſurface is more or leſs wrinkled, and of a greyiſh colour, and the inner ſurface is of a dull brown. Its ſubſtance is of a yellowiſh-brown colour. Its fracture is ſhort and reſinous. Its taſte is intenſely bitter, and ſlightly aromatic, leaving a ſtrong ſenſe of heat and pungency in the throat and fauces The odour is peculiar. The powder is yellow.

According to the experiments related by Mr. Brande, from 3840 parts of anguſtura, there were extracted by alcohol, 144 of reſin, and 300 of an acrid unctuous ſubſtance, the reſiduum yielded to water 1500 of dry gummy extract. Treated firſt with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards, 161 of a reſin of a light brown colour, and extremely acrid. By diſtillation it gave 26 of eſſential oil. The tincture is of a deep yellow colour, reddens infuſion of turnſole, and becomes turbid and white on admixture with water. By repeated filtration a browniſh reſin is ſeparated, and the tranſparent fluid has a pale yellow colour. I find that it is not precipitated by ſolution of gelatin, but by infuſion of galls. It therefore does not contain tannin but cinchonin, and it has the peculiar property of acquiring a deep red colour with red ſulphate of iron, and depoſiting a purpliſh ſlate-coloured precipitate.

Med. uſe.—As an aromatic bitter, it acts as a tonic and ſtimulant of the organs of digeſtion. It increaſes the appetite for food, removes flatulence and acidity ariſing from dyſpepſia, and is a very effectual remedy in diarrhœa proceeding from weakneſs of the bowels, and in dyſentery; and it poſſeſſes the ſingular advantage of not oppreſſing the ſtomach, as cinchona is apt to do. It does not cure intermittents.

It is exhibited, 1. In powder, in doſes of from 5 to 20 grains, either alone or with rhubarb, magneſia, or carbonate of lime,

2. In infuſion. The infuſion of one drachm in four ounces of water may be uſed daily.

3. In tincture.
4. In watery extract.

ANTHEMIS.

Willd. g. 1517. *Syngenesia Polygamia Superflua.*—Nat. ord. *Compositæ Radiatæ.*

Sp. 15. ANTHEMIS NOBILIS. *Ed.* *Chamæmelum Flores. Lond. Dub.*

Chamomile.

Off.—Herba et flos. The herb and flowers.

CHAMOMILE is a perennial plant, indigenous in the south of England, but cultivated in our gardens for the purposes of medicine. The flowers have a strong, not ungrateful, aromatic smell, and a very bitter nauseous taste.

Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed their antispasmodic, carminative, cordial, and diaphoretic effects; to the former, their influence in promoting digestion.

Neumann obtained from 480 parts, 180 of alcoholic extract, and afterwards 120 of watery; and reversing the procedure, 240 of watery, and 60 alcoholic.

Med. use.—Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, in the afterpains, in gout, in podagra, in intermittents, and in typhus.

As chamomile excites the peristaltic motion, it is useful in dysentery, but is not admissible in all cases of diarrhoea. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting, especially when given in warm infusion; and in this way is often used to assist the action of other emetics.

Externally, chamomile flowers are applied as a discutient and emollient, in the form of clyster or embrocation, in colic, dysentery, and strangulated hernia, &c.

Chamomile flowers are exhibited,

1. In substance, in the form of powder, or rather of electuary, in doses of from half a drachm to two drachms, either alone, or combined with Peruvian bark, as for the cure of intermittent fevers.

2. In infusion, in the form of tea. This may either be drunk warm, for promoting the action of emetics, or cold, as a stomachic.

3. In decoction or extract. These forms contain only the extractive, and therefore may be considered as simple bitters.

4. The essential oil may be obtained by distillation. This possesses the antispasmodic powers in a higher degree than the simple flowers, but on the contrary, does not possess the virtues depending on the presence of the bitter extractive.

Off. prep.—Decoct. *Ed. Lond. Dub.* Extract, *Lond. Ed. Dub.*

Sp. 25. ANTHEMIS PYRETHRUM. *Ed.* *Pyrethrum. Lond. Dub.*
Pellitory of Spain.
Off.—Radix. The root.

THIS plant, though a native of warm climates, as Barbary, bears the ordinary winters of this country, and often flowers successively from Christmas to May: the roots also grow larger with us than those with which the shops are usually supplied from abroad. They are seldom so big as the little finger, and the best are dry compact, of a brown colour, and not easily cut with a knife.

Pellitory root has no sensible smell; its taste is very hot and acrid, but less so than that of arum; the juice expressed from it has scarce any acrimony, nor is the root itself so pungent when fresh, as after it has been dried. Neumann obtained from 960 parts of the dry root, only 40 of alcoholic extract, and afterwards 570 of watery, and by a reverse procedure, 600 of watery, and 20 of alcoholic extract. Both the alcoholic extracts were excessively pungent. Its acrimony, therefore, was derived from a resin.

Med. use.—The principal use of pyrethrum in the present practice is as a masticatory, for promoting the salival flux, and evacuating the viscid humours from the head and neighbouring parts; by this means it often relieves the toothach, some kinds of pains of the head, and lethargic complaints. A vinous infusion is also useful in debility of the tongue.

ANTIMONIUM. *Stibium.*
Antimony.

The physical and chemical properties of this metal have been already described.

Antimony is found,

I. In its metallic state, at Stahlberg in Sweden, and Allemont in France.

II. Mineralized with sulphur.

1. Grey antimony.
   a. Compact.
   b. Foliated.
   c. Striated (74 antimony, 29 sulphur, Bergmann.)

d. Plumofe (fulphuret of antimony with arfenic and iron, Berg.)

2. Red antimony (hydroguretted fulphuret of antimony).

III. Oxidized. Mongez.

IV. Acidified.

1. Muriated.

2. Phofphated. Yellow ore of antimony, Razumoufky.

The grey ore of antimony is the ftate in which it is officinal, and alfo that in which it is moft commonly found.

SULPHURETUM ANTIMONII. *Ed.* *Antimonium.* *Lond.* *Stibium.* *Dub.*

Sulphuret of antimony.

Whatever opinion may be formed of the nomenclature adopted by the Edinburgh college in general, the propriety of the change which they have introduced in this and fimilar inftances cannot be difputed; for while chemifts, according to rational principles, defignated fimple fubftances by fimple names, the fame names continued to be given by pharmaceutical writers to compound ftates of thefe bodies. To have eftablifhed, therefore, an uniformity of nomenclature in fciences fo intimately allied, cannot fail to be confidered as an improvement of the greateft importance.

Although fulphuretted antimony be a natural production, yet it is commonly fold in the form of loaves, which have been feparated from the ftony, and other impurities of the ore, by fufion, and a fpecies of filtration. For the ore is melted in conical well-baked earthen pots, having one or more fmall holes in their apices. The fire is applied round and above thefe pots; and as foon as the fulphuretted antimony melts, it drops through the holes into veffels placed beneath to receive it, while the ftony and other impurities remain behind. As antimony is very volatile, the mouths and joinings of the pots muft be clofed and luted. The upper part of the loaves thus obtained is more fpongy, lighter, and impure than the lower, which is therefore always to be preferred. Thefe loaves have a dark-grey colour externally, but on being broken, they appear to be compofed of radiated ftriæ, of a metallic luftre, having the colour of lead. The goodnefs of the loaves is eftimated from their compactnefs and weight, from the largenefs and diftinctnefs of the ftriæ, and from their being entirely vaporizable by heat. Lead has been fold for antimony; but its texture is rather foliated than ftriated, and it is not vaporizable. The prefence of arfenic, which renders the antimony ufelefs for medical purpofes, is known by its emitting the fmell of garlic when thrown upon live coals, and by other tefts mentioned under

arſenic. The preſence of manganeſe or iron is known by their not being volatilized by a red heat.

Antimony is obtained from its ores by gradually detonating in a large crucible four parts of ſulphuretted antimony, three of crude tartar, and one and a half of dry nitrate of potaſs, reduced to a fine powder, and intimately mixed. The detonated maſs is then to be fuſed, and poured into a heated mould, greaſed with a little fat, in which it is allowed to conſolidate. It is then turned out, and the ſcoriæ are ſeparated from the antimony, which will weigh about one fourth part of the ſulphuret employed. The ſcoriæ are a mixture of ſulphuret of potaſs and of antimony, and may be preſerved for other purpoſes.

Another method of obtaining antimony, is by melting three parts of ſulphuretted antimony with one of iron. The ſulphur quits the antimony, and combines with the iron.

Formerly antimony was given internally; but as its action depended entirely on the acid it met with in the ſtomach, its effects were very uncertain, and often violent. Cups were alſo made of antimony, which imparted to wine that ſtood in them for ſome time an emetic quality. But both theſe improper modes of exhibiting this metal are now laid aſide.

Med. uſe.—Sulphuretted antimony was employed by the ancients in collyria, againſt inflammations of the eyes, and for ſtaining the eye-brows black. Its internal uſe does not ſeem to have been eſtabliſhed till towards the end of the fifteenth century; and even at that time it was by many looked upon as poiſonous. But experience has now fully evinced, that it has no noxious quality, being often uſed, particularly in chronic eruptions; that ſome of the preparations of it are medicines of great efficacy; and that though many of them are moſt violently emetic and cathartic, yet even theſe, by a ſlight alteration or addition, loſe their virulence, and become mild in their operation.

Off. prep.—Antimony is at preſent the baſis of many officinal preparations, to be afterwards mentioned. But beſides thoſe ſtill retained, many others have been formerly in uſe, and are ſtill employed by different practitioners. The following table, drawn up by Dr. Black, exhibits a diſtinct view of the whole.

Dr. Black's Table of the Preparations of Antimony.

Medicines are prepared either from crude antimony, or from the pure metallic part of it called regulus.

From Crude Antimony.

I. By trituration.

Antimonium præparatum. Lond.

II. By the action of heat and air.
Flores antimonii sine addito.
Vitrum antimonii. Ed.
Antimonium vitrificatum. Lond.
Vitrum antimonii ceratum. Ed.

III. By the action of alkalies.
Hepar antimonii mitissimum.
Regulus antimonii medicinalis.
Hepar ad kermes minerale. *Geoffroi.*
Hepar ad tinct. antimonii.
Kermes minerale.
Sulphur antimonii præcipitatum. Ed. et Lond.

IV. By the action of nitre.
Crocus antim. mitissimus, *vulgo Regulus antim. medicinalis.*
Crocus antimonii. Ed. et Lond.
Antimonii emeticum mitius. Boerh.
Antim. ustum cum nitro, *vulgo* Calx antimonii nitrata. Ed.
Antimonium calcinatum. Lond. *Vulgo Antimonium diaphoret.*
Antim. calcareo-phosphoratum, sive pulvis antimonialis. Ed.
Pulvis antimonialis. Lond.

V. By the action of acids.
Antim. vitriolat. Klaunig.
Antim. cathartic. Wilson.
Antimonium muriatum, *vulgo* Butyrum antim. Ed.
Antimonium muriatum. Lond.
Pulvis algarothi, sive *Mercurius Vitæ.*
Bezoardicum minerale.
Antimonium tartarisatum, *vulgo* Tartarus emeticus. Ed.
Antimonium tartarisatum. Lond.
Vinum antimonii tartarisati. Ed. et Lond.
Vinum antimonii. Lond.

From the Regulus.

This metal, separated from the sulphur by different processes, is called *Regulus antimonii simplex*, *Regulus martialis*, *Regulus jovialis*, &c. From it were prepared,

I. By the action of heat and air,
Flores argentei, sive nix antim.

II. By the action of nitre,
Cerussa antimonii.

Stomachicum Poterii.
Antihecticum Poterii.
Cardiacum Poterii.

PREPARATIONS which have their name from ANTIMONY, but ſcarcely contain any of it.

Cinnabaris antimonii.
Tinctura antimonii.

To this table of Dr. Black's, which is left unaltered, I ſhall add another, not taken from the mode of preparation, but from the nature of the product.

ANTIMONY has been exhibited,

I. In its metallic ſtate.
 a. Antimonium. Regulus antimonii.
 b. Alloyed,
  1. With iron. Regulus antimonii martialis.
  2. With tin. Regulus antimonii jovialis.
  3. With tin and copper. Regulus metallorum.
 c. Combined with ſulphur,
  1. Sulphuretum antimonii. Ed. Antimonium. Lond. Stibium. Dub. Sulph. ant. ppt. E. L. D.
  2. Regulus antimonii medicinalis. Maët. Febrifugum Craanii.

II. Oxidized,
 a. Protoxide.
  1. Calx antimonii *per ſe.* Cinis antimonii.
  2. Flores antimonii argentini.
  3. Calx ſtibii præcip. D. Pulvis algarothi.
  4. Combined with ſulphuret of antimony.
 a. Oxidum antimonii cum ſulphure vitrificatum. E. Antim. vitrif. L. Vitrum antimonii.
 Melted with wax. Oxidum antimonii vitrif. cum cera. E.
 b. Oxidum antimonii cum ſulph. per nitrat. potaſſæ, E. Stibium nitro calin at. D. Crocus antimonii. L. Crocus metallorum. Hepar antim.
  5. Combined with ſulphuretted hydrogen. Sulphuret. ant. præcip. E. Sulph. ant. præcip. L. Sulph. ſtibiat. rufum, D. Sulphur auratum antimonii.
  6. With hydroguretted ſulphur. Sulphur ſtibiat. fuſcum, D. Kermes minerale.

7. With muriatic acid. Murias antim. E. Ant. mur. L. Stib. muriat. cauſt. D. Butyrum antimonii.
8. With tartaric acid and potaſs. Tartris antimonii, E. Ant. tart. L. Tart. ſtibiat. D. Tartarus emeticus.

Diſſolved in wine. Vinum tart. ant. E. Vin. tart. ſtib. D. Vin. ant. tart. L. Vin. ant. L. Vinum antimoniale.

9. With phoſphate of lime. Oxidum antimonii cum phoſphate calcis, E. Pulv. ant. L. Pulv. ſtib. D. *James's powders.*

b. Peroxide.

Antimonium calcinatum. Lond.

Theſe are the principal preparations of antimony. In eſtimating their comparative value, we may attend to the following obſervations. All the metallic preparations are uncertain, as it entirely depends on the ſtate of the ſtomach, whether they have no action at all, or operate with dangerous violence. The ſulphuret is expoſed, though in a leſs degree, to the ſame objections.

The preparations in which antimony is in the ſtate of peroxide, are perfectly inſoluble in any vegetable or animal acid, and are alſo found to be inert when taken into the ſtomach.

The remaining preparations of antimony, or thoſe in which it is in the ſtate of protoxide, are readily ſoluble in the juices of the ſtomach, and act in very minute doſes. Of its ſaline preparations, only thoſe can be uſed internally which contain a vegetable acid; for its ſoluble combinations with the ſimple acids are very acrid and corroſive. In general, the ſureſt and beſt preparations of antimony are thoſe which contain a known quantity of the metal in its ſtate of protoxide.

The general effects of antimonials are, in ſmall doſes, diaphoreſis, nauſea; in large doſes, full vomiting and purging. Some allege that antimonials are of moſt uſe in fevers when they do not produce any ſenſible evacuation, as is ſaid to be the caſe ſometimes with James's powder. They therefore prefer it in typhus, and emetic tartar in ſynochus, in which there is the appearance at firſt of more activity in the ſyſtem, and more apparent cauſe for evacuation.

APIUM PETROSELINUM. (*Ed.*) *Petroſelinum.* (*Lond.*) Parſley.

Off.—Radix, ſemen. The root and ſeed.

Willd. g. 563. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Parsley is a biennial plant, and a native of the South of Europe. It is very generally cultivated in this country for culinary purpofes. The feeds have an aromatic flavour, and are occafionally made ufe of as carminatives. The tafte of the root is fomewhat fweetifh, with a light degree of warmth and aromatic flavour, and it poffeffes gentle diuretic properties.

AQUA.
Water.

Water does not enter the lift of materia medica of any of the colleges, but it is fo important an agent, both in the cure of difeafe, and in the practice of pharmacy, that a brief account of its varieties and properties can fcarcely be confidered as fuperfluous.

The chemical properties of water have been already enumerated. The pureft natural water is fnow, or rain water, collected in the open fields; that which falls in towns, or is collected from the roofs of houfes, is contaminated with foot, animal effluvia, and other impurities, although after it has rained for fome time, the quantity of thefe diminifhes fo much, that Morveau fays that it may be rendered almoft perfectly pure by means of a little barytic water, and expofure to the atmofphere. Rain water, after it falls, either remains on the furface of the earth, or penetrates through it until it meet with fome impenetrable obftruction to its progrefs, when it burfts out at fome lower part, forming a fpring or well. The water on the furface of the earth either defcends along its declivities in ftreams, which gradually wearing channels for themfelves, combine to form rivers, which at laft reach the fea, or remain ftagnant in cavities of confiderable depth, forming lakes or ponds, or on nearly level ground forming marfhes.

The varieties of fpring water are exceedingly numerous; but they may be divided into the foft, which are fufficiently pure to diffolve foap, and to anfwer the purpofes of pure water in general; the hard, which contain earthy falts and decompofe foap, and are unfit for many purpofes, both in domeftic economy and in manufactures; and the faline, which are ftrongly impregnated with foluble falts. When fpring waters poffeffes any peculiar character, they are called mineral waters. River water is in general foft, as it is formed of fpring water, which by expofure becomes more pure; and running furface water, which although turbid from particles of clay fufpended in it, is otherwife very pure. Lake water is fimilar to river water. The water of marfhes on the contrary is exceeding impure, and often highly fetid, from the great proportion of animal and vegetable matters which is conftantly decaying in them.

Mineral waters derive their peculiarity of character in general, either from containing carbonic acid, or soda, not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron, or from their temperature exceeding in a greater or less degree that of other surrounding bodies. The following are the most celebrated:

a. Warm springs.—Bath, Bristol, Buxton, Matlock, in England. Barege, Vichy, &c. in France. Aix-la-Chapelle, Borset, Baden, Carlsbad, and Toeplitz, in Germany; and Pisa, Lucca, Baia, and many others in Italy.
b. Carbonated springs.—Pyrmont, Seltzer, Spa, Cheltenham, Scarborough.
c. Alkaline.—Carlsbad, Aix-la-Chapelle, Barege, Toeplitz.
d. Sulphureous.—Enghien, Lu, Aix-la-Chapelle, Kilburn, Harrowgate, Moffat, and many in Italy.
e. Purging—Sea water, Lemington Priors, Harrowgate, Lu, Carlsbad, Moffat, Toeplitz, Epsom, Sedlitz, Kilburn, and all brackish waters.
f. Calcareous.—Matlock, Buxton, and all hard waters.
g. Chalybeate.—Hartfell, Denmark, Cheltenham, Pyrmont, Spa, Tunbridge, Bath, Scarborough, Vichy, Carlsbad, Lemington Priors.

Medical use.—Water is an essential constituent in the organization of all living bodies; and as it is continually expended during the process of life, that waste must be also continually supplied, and this supply is of such importance that it is not left to reason or to chance, but forms the object of an imperious appetite. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. Water about 60° gives no sensation of heat or cold, between 60° and 45° it gives a sensation of cold followed by a glow and increase of appetite and vigour, below 45 the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60 it excites nausea and vomiting, probably by partially relaxing the fibres of the stomach, for when mixed with stimulating substances it has not these effects. In the stomach and in the intestines it acts also by its bulk, producing the effects arising from the distention of these organs; and as the intestinal gases consist of hydrogen gas, either pure or carbonated, or sulphuretted, or phosphuretted, it is probably in part decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals, dilutes the chyle and the blood, increases their fluidity, lessens their acrimony, and produces *plethora ad molem.* Its effects in pro-

ducing plethora and fluidity are however very tranſitory, as it at the ſame time increaſes the ſecretion by the ſkin and kidneys. Indeed the effects of ſudorifics and dieuretics depend in a great meaſure on the quantity of water taken along with them.

Mineral waters have alſo a ſpecific action depending on the foreign ſubſtances which they contain. It is however neceſſary to remark that their effects are in general much greater than might be expected from the ſtrength of their impregnations, owing probably to the very circumſtance of their great dilution, by which every particle is preſented in a ſtate of activity, while the lacteals admit them more readily than they would in a leſs diluted ſtate.

Carbonic acid gas gives to the waters which are ſtrongly impregnated with it a ſparkling appearance, and an agreeable degree of pungency. In its effects on the body it is decidedly ſtimulant, and even capable of producing a certain degree of tranſient intoxication. It is of great ſervice in bilious complaints, atony of the ſtomach, nauſea, and vomiting, and in all fevers of the typhoid type.

Alkaline waters produce alſo a tonic effect on the ſtomach, but they are leſs grateful. They are particularly ſerviceable in morbid acidity of the ſtomach, and in diſeaſes of the urinary organs.

Sulphureous waters are chiefly uſed in cutaneous and glandular diſeaſes. Their effects are ſtimulant and heating, and they operate by the ſkin or bowels.

Purging waters derive their effects from the neutral ſalts they contain, eſpecially the muriates of ſoda, lime, and magneſia, and the ſulphates of ſoda and magneſia. They are much more frequently uſed for a length of time to keep the bowels open by exciting the natural action, than to produce full purging. Uſed in this way, inſtead of debilitating the patient, they increaſe his appetite, health, and ſtrength.

Chalybeate waters are uſed as tonics. They ſtimulate conſiderably, and increaſe the circulation; but as they alſo generally contain neutral ſalts, they act as gentle laxatives. They are uſed in all caſes of debility, cachexia, chloroſis, fluor albus, amenorrhœa, and in general in what are called nervous diſeaſes.

The external uſe of water depends almoſt entirely on its temperature, which may be

1. Greater than that of the body, or above 97° F. The hot bath.

2. Below the temperature of the body.
   a. From 97 to 85, the warm bath.
   b. From 85 to 65, the tepid bath.
   c. From 65 to 32, the cold bath.

The hot bath is decidedly ſtimulant in its action. It renders the pulſe frequent, the veins turgid, the ſkin red, the face fluſhed, the reſpiration quick, increaſes animal heat, and produces ſweat. If the temperature be very high, the face becomes bathed in ſweat, the arteries at the neck and temples beat with violence, anxiety and a ſenſe of ſuffocation are induced, and if perſiſted in, vertigo, throbbing in the head, and apoplexy, are the conſequences. It is very rarely employed in medicine, except where there are hot ſprings, as at Baden in Switzerland. The Ruſſians and ſome other nations uſe the hot bath as an article of luxury.

The effects of the affuſion of hot water have not been aſcertained, and it is probable that when the heat is not ſo great as to deſtroy the organization of the ſkin, the very tranſient application of the water would be more than counteracted by the ſubſequent evaporation.

With regard to the action ariſing from their temperature, all baths below 97° differ only in degree, as they all ultimately abſtract caloric from the ſurface, but with a force inverſely as their temperature.

The warm bath excites the ſenſation of warmth, partly becauſe our ſenſations are merely relative, and partly becauſe its temperature, though leſs than that of the internal parts of the body, is actually greater than that of the extremities which are the chief organs of touch. But as water is a much better conductor of caloric than air, and eſpecially than confined air, as much caloric is abſtracted from the body by water, which is only a few degrees lower than the internal temperature of the body, as by air of a much lower temperature. The warm bath diminiſhes the frequency of the pulſe, eſpecially when it has been previouſly greater than natural, and this effect is always in proportion to the time of immerſion. It alſo renders the reſpiration ſlower, and leſſens the temperature of the body, relaxes the muſcular fibre, increaſes the bulk of the fluids by abſorption, removes impurities from the ſurface, promotes the deſquamation and renewal of the cuticle, and ſoftens the nails and indurations of the ſkin.

The ſtimulant power of the warm bath is therefore very inconſiderable, and its employment in diſeaſe will be chiefly indicated by preternatural heat of the ſurface and frequency of the pulſe, rigidity of the muſcular fibre, and morbid affections of the ſkin. It has accordingly been found ſerviceable in many caſes of pyrexia, both febrile and exanthematous, in many ſpaſmodic diſeaſes, and in moſt of the impetigines. It is contraindicated by difficulty of breathing, and internal organic affections, and ſhould not be uſed when the ſtomach is full.

The affufion of warm water very generally produces a confiderable diminution of heat, a diminifhed frequency of pulfe and refpiration, and a tendency to repofe and fleep; but its effects are not very permanent, and its ftimulus is weak. It is recommended in febrile difeafes depending on the ftimulus of preternatural heat, and in thofe attended with laborious refpiration, and in the paroxyfms of hectic fever.

As the tepid bath and affufion produce effects intermediate between thofe of warm and cold water, it is unneceffary to enumerate them.

The cold bath produces the fenfation of cold, which gradually ceafes, and is fucceeded by numbnefs. It excites tremors in the fkin, and fhivering. The fkin becomes pale, contracted, and acquires the appearance termed *cutis anferina.* The fluids are diminifhed in volume, the folids are contracted, the caliber of the veffels is leffened, and therefore numbnefs and palenefs are induced, and the vifible cutaneous veins become fmaller. There is a fenfe of drowfinefs and inactivity, the joints become rigid and inflexible, and the limbs are affected with pains and fpafmodic contractions. The refpiration is rendered quick and irregular, the pulfe flow, firm, regular, and fmall; the internal heat is at firft diminifhed, but gradually and irregularly returns nearly to its natural ftandard; the extremities, however, continue cold and numb, or fwollen and livid; the perfpiration is fuppreffed, and the difcharge of urine is rendered more frequent and copious. If the cold be exceffive on its application, long continued violent fhiverings are induced, the pulfe ceafes at the wrift, the motion of the heart becomes feeble and languid, there is a fenfation of coldnefs and faintnefs at the ftomach, and a rapid diminution of animal heat; and at laft, delirium, torpor, and death, are the confequences. If the application of the cold bath be not carried to an exceffive length, on emerging from the water, the whole body is pervaded by an agreeable fenfation of warmth, and the patient feels refrefhed and invigorated.

The primary action of the cold bath is ftimulant, and the degree of this action is in proportion to the lownefs of its temperature. This opinion is indeed directly oppofite to a theory of cold which has been advanced with the confidence of demonftration. "Heat is a ftimulus; cold is the abftraction of heat; there-"fore cold is the abftraction of ftimulus, or is a fedative." To this we might oppofe another theory, equally fyllogiftic, and nearer the truth: Free caloric is a ftimulus; cold is the fenfation excited by the paffage of free caloric out of the body; therefore cold is a ftimulus. But in fact the action of cold is by no means fo fimple. It is complicated, and varies according to its intenfity, duration, and the ftate of the fyftem to which it is applied.

It acts at firſt as a ſtimulant, in exciting ſenſation; then as a tonic, in condenſing the living fibre; and laſtly, however paradoxical it may appear, as a ſedative, by preventing that diſtribution of blood in the minute and ultimate veſſels, which is neceſſary for the exiſtence of ſenſibility and irritability, and by the abſtraction of the ſtimulus of heat.

The cold bath may be therefore ſo managed as to procure any of theſe effects by regulating the length of time for which it is applied.

Cold affuſion, or the pouring of cold water over the body, is a very convenient way of applying the cold bath in many caſes. In this way cold is very ſuddenly applied to the ſurface, its operation is inſtantaneous and momentary, but may be continued by repeated affuſions for any length of time, and ſo as to produce its extreme effects. Where the effects of cold affuſion may be thought too ſevere, ſpunging the body with cold water, or water and vinegar may be ſubſtituted.

The application of cold may be employed in fevers and febrile paroxyſms, when the heat is ſteadily above the natural ſtandard, and in many diſeaſes ariſing from relaxation and debility. It is contraindicated when the heat of the body is below 97°, when there is any notable perſpirationfrom the ſurface, and when there is general plethora. Irritable habits ſhould be defended from the violence of its action, by covering the body with flannel.

In yellow fever, eſpecially in thoſe caſes in which the heat of the ſkin is exceſſive, it is particularly uſeful, and ought to be long continued. In phrenitis, and other local inflammations, it promiſes to be of advantage. In gout its effects are doubtful, being in ſome inſtances ſalutary, in others deſtructive. A criterion, to enable us to determine when it ought or ought not to be reſorted to, is much wanted. In inflammatory rheumatiſm and rheumatic gout it is decidedly uſeful. It is of advantage in all the hæmorrhagies and exanthemata; in tetanus, colic, cholera, hyſteria, mania, iſchuria, and in burns; and in general in all thoſe local diſeaſes in which ſolutions of acetate of lead, of muriate of ammonia, &c. are uſually employed, for the good effects of theſe depend almoſt entirely on their diminiſhed temperature.

Pharm. prep.—Aqua diſtillata, *Ed. Lond. Dub.* It alſo enters into the compoſition of the greateſt number of preparations.

ARBUTUS UVA URSI. *Ed.* *Uva Urſi. Lond. Dub.* Whortleberry.

Off.—Folium. The leaves.

Willd. g. 871, *ſp.* 7.—*Decandria Monogynia.*—Nat. ord. *Bicornes.*

This is a very ſmall evergreen ſhrub. The leaves are oval, not toothed, and their under ſurface is ſmooth and pale green. They grow wild in the woods, and on ſand hills in Scotland, and in almoſt every country in Europe. The *green* leaves alone, Dr. Bourne ſays, ſhould be ſelected and picked from the twigs, and dried by a moderate expoſure to heat. The powder, when properly prepared, is of a light brown colour, with a ſhade of greeniſh yellow, has nearly the ſmell of good graſs hay, as cut from the rick, and to the taſte is at firſt ſmartly aſtringent and bitteriſh, which ſenſations gradually ſoften into a liquorice flavour. Digeſted in alcohol they give out a green tincture, which is rendered turbid by water, and when filtered, paſſes tranſparent and yellow, while a green reſin remains on the filter. They are powerfully aſtringent, approaching, in the deepneſs of the colour which they give to red ſulphate of iron, more nearly to nut-galls than any ſubſtance I have tried. Indeed in ſome parts of Ruſſia they are uſed for tanning.

Medical uſe.—The medical effects of this medicine depend entirely on its aſtringent and tonic powers. It is therefore uſed in various fluxes ariſing from debility, menorrhagia, fluor albus, cyſtirrhœa, diabètes, enureſis, diarrhœa, dyſentery, &c. It has been ſtrongly recommended in phthiſical complaints by Dr. Bourne, and in diſeaſes of the urinary organs by De Haen, particularly in ulcerations of the kidneys and bladder. It certainly alleviates the dyſpeptic ſymptoms accompanying nephritic complaints. It is commonly given in the form of powder, in doſes of from 20 to 60 grains three or four times a-day.

ARCTIUM LAPPA. *Ed.* *Bardana.* *Lond. Dub.*
Burdock.
Off.—Radix. The root.
Willd. g. 1429, *ſp.* 1. *Syngeneſia Polygamia Æqualis.*—Nat. ord. *Compoſitæ Capitatæ.*.

This is a perennial plant, which grows wild in uncultivated places. The ſeeds have a bitteriſh ſubacrid taſte: they are recommended as very efficacious diuretics, given either in the form of emulſion, or in powder, to the quantity of a drachm. The roots taſte ſweetiſh, with a light auſterity and bitteriſhneſs: they are eſteemed aperient, dieuretic, and ſudorific, and are ſaid to act without irritation, ſo as to be ſafely ventured upon in acute diſorders. Decoctions of them have of late been uſed in rheumatic, gouty, venereal, and other diſorders; and are preferred by ſome to thoſe of ſarſaparilla.

ARGENTUM. *Ed. Lond.* *Argentum in laminas extenſum. Dub.*
Silver. Silver leaf.

THE chemical and phyſical properties of ſilver have been already enumerated.

Silver is found,

I. In its metallic ſtate:
   1. Pure.
   2. Alloyed with gold. Auriferous ſilver ore.
   3. ———— antimony.
   4. ———— iron and arſenic.
   5. ———— biſmuth.

II. Combined with ſulphur:
   1. Sulphuretted ſilver. Vitreous ſilver ore.
   2. ———— with antimony, iron, arſenic, and copper. Black or brittle ſilver ore.
   3. ———— with copper and antimony. Black ſilver ore.
   4. Sulphuretted ſilver with lead and antimony. White ſilver ore.

III. Oxidized:
   1. Combined with carbonic acid and antimony.
   2. ———— muriatic acid.
      a. Corneous ſilver ore.
      b. Earthy ſilver ore.
      c. Sooty ſilver ore.
   3. Combined with ſulphur and oxide of antimony. Red ſilver ore.
   4. ———— molybdic acid.

Off. prep.—Nitras argenti, *Ed. Lond. Dub.*

ARISTOLOCHIA SERPENTARIA. *Ed.* *Serpentaria Virginiana. Lond. Dub.*

Virginian Snake-root.

Officinal.—Radix. The root.

Gynandria Hexandria.—Nat. ord. *Sarmentoſæ.*

THIS is a ſmall, light, buſhy root, conſiſting of a number of ſtrings or fibres matted together, iſſuing from one common head; of a browniſh colour on the outſide, and paler or yellowiſh within. It has an aromatic ſmell, like that of valerian, but more agreeable: and a warm, bitteriſh, pungent taſte, very much reſembling that of camphor. I find that, treated with alcohol, it affords a bright green tincture, which is rendered turbid by water; by filtration a ſmall portion of a green matter is ſeparated,

but its tranſparency is not reſtored. It neither precipitates tannin or gelatin, nor affects the ſalts of iron or tincture of turnſole. When the diluted tincture is diſtilled, the ſpirit and tincture paſs over milky, ſtrongly impregnated with its peculiar flavour.

Medical uſe.—Its virtues are principally owing to the eſſential oil with which it abounds. Its general action is heating and ſtimulant; its particular effects, to promote the diſcharge by the ſkin and urine. In its effects it therefore coincides with camphor, but ſeems to be a more permanent ſtimulus.

It is recommended,

1. In intermittent fevers, eſpecially when the paroxyſms do not terminate by ſweating, and to aſſiſt the action of Peruvian bark in obſtinate caſes.
2. In typhus, and in putrid diſeaſes, to ſupport the *vis vitæ*, and to excite gentle diaphoreſis.
3. In exanthematous diſeaſes, when the fever is of the typhoid type, to ſupport the action of the ſkin, and keep out the eruption.
4. In gangrene. Externally it is uſed as a gargle in the putrid ſore throat.

It is exhibited,

1. In powder, which is the beſt form, in doſes of twenty or thirty grains.
2. In infuſion with wine or water. By decoction its powers are entirely deſtroyed.

It is often combined with Peruvian bark, or with camphor.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. cinchon. comp. *Lond. Dub.* Elect. opiat. *Ed.* Cataplaſma cumini, *Lond.*]

ARNICA MONTANA. *Ed. Dub. L*[illegible]

German Leopards-bane.

Off.—Flos, herba, radix. The flower, herb, and root.

Willd. g. 1491. *ſp.* 1. *Syngeneſia Polygamia ſuperflua.*—Nat. ord. *Compoſitæ radiatæ.*

Leopards-Bane is a very common perennial plant in the alpine parts of Germany, in Sweden, Lapland, and Switzerland. The flowers, which are of a yellow colour, and compound, conſiſting entirely of tubular florets, are diſtinguiſhed from ſimilar flowers, with which they are often mixed, from ignorance or fraud, by the common calyx, which is ſhorter than the florets, and conſiſts

entirely of lancet-ſhaped ſcales, lying parallel, and cloſe to each other, of a green colour, with purple points. The calyx of the different ſpecies of Inula are compoſed of briſtle-ſhaped ſcales, reflected at the points, and beſet with hairs. The florets of the genus Hypochæris are ſtrap-ſhaped.

Theſe flowers have a weak bitteriſh taſte, evidently combined with a degree of acrimony; and when rubbed with the fingers, have a ſomewhat aromatic ſmell. Their active conſtituents are not ſufficiently aſcertained. They evidently contain a great deal of reſin, and ſome eſſential oil.

Medical uſe.—In their effects they are ſtimulating, and ſuppoſed to be diſcutient. In ſmall doſes, and properly adminiſtered, they poſſeſs very beneficial effects, in raiſing the pulſe, in exciting the action of the whole ſanguiferous ſyſtem, in checking diarrhœas, in promoting expectoration, and, moſt particularly, in removing paralytic affections of the voluntary muſcles; but their uſe is frequently attended with no ſenſible operation, except that in ſome caſes of paralyſis, the cure is ſaid to be preceded by a peculiar prickling, and by ſhooting pains in the affected parts. When given improperly, or in too large doſes, they excite an inſupportable degree of anxiety, ſhooting and burning pains, and even dangerous hæmorrhagies, vomiting, vertigo, and coma. For theſe dangerous ſymptoms, vinegar is ſaid to be the beſt remedy.

They have been recommended,

1. In paralytic diſorders, in chronic rheumatiſm, in retention of the urine, from paralyſis of the bladder, in amauroſis.
2. In intermittent fevers, combined with Peruvian bark.
3. In dyſentery and diarrhœa, but in ſome caſes they have had bad effects
4. In putrid diſeaſes.
5. In typhoid inflammations.
6. To promote the uterine diſcharge.
7. And in internal pains, and congeſtions, from bruiſes. In the countries where they are indigenous, the flowers of the leopards-bane have long been a popular remedy in theſe accidents

They are contraindicated by an inflammatory diatheſis, a prediſpoſition to hæmorrhagies, and internal congeſtions.

They are beſt exhibited in the form of infuſion. One or two ſcruples may be infuſed with half a pound of water, and drunk at proper intervals. The flowers ſhould be wrapt up in a piece of linen, as otherwiſe their down is apt to be diffuſed in the liquid, and to cauſe violent irritation of the throat.

Root.—The dried root of this plant is about the thicknefs of a fmall quill, and fends out fibres along on one fide. Externally it is rough, and of a red brown colour, internally of a dirty white. Its tafte is acrid, and flightly bitter. Neumann extracted from 960 parts 840 watery extract, and 5 alcoholic; and inverfely 270 alcoholic, and 540 watery.

Medical ufe.—It is exhibited in the fame manner and circumftances as the flowers, but it is more apt to excite vomiting. In powder its dofe is from five to ten grains.

ARSENICUM.

Arfenic.

THE general properties of this metal have been already enumerated.

Arfenic is found,

I In its metallic ftate:
- 1. Alloyed with iron. Native arfenic.
- 2. ——— iron and gold.
- 3. ——— cobalt.
- 4. Combined with iron and fulphur. Arfenical pyrites.
- 5. ——— iron, fulphur, and filver. White arfenical pyrites.

II. Oxidized:
- 1. Uncombined. White oxide of arfenic. Arfenious acid.
- 2. Combined with fulphur:
  - *a.* Oxide of arefenic 90, fulphur 10, Orpiment. Yellow fulphuretted arfenic.
  - *b.* Oxide of arfenic 84, fulphur 16, Realgar. Red fulphuretted arfenic.

III. Acidified and combined:
- 1. With lime.
- 2. With copper.
- 3. With iron.
- 4. With lead.
- 5. With nickel.
- 6. With cobalt.

OXIDUM ARSENICI. *Ed.*

Oxide of arfenic. (Arfenious acid, Fourcroy.)

THIS fubftance, which was formerly named, improperly, arfenic, is moft generally obtained in the procefs of roafting the ores

of cobalt in Saxony. The roaſting is performed in a kind of reverberatory furnace, with which a very long chimney is connected, lying in a horizontal direction. The arſenious acid is condenſed in it in the form of a looſe grey powder, which, by a ſecond ſublimation with a little potaſs, and in a great degree of heat, coaleſces into a firm vitreous ſublimate, which gradually becomes opaque by expoſure to the air. In this ſtate it is the white arſenic of commerce, or, as it ſhould be termed, the arſenious acid. For internal uſe, the lumps of a ſhining appearance and dazzling whiteneſs ſhould be choſen; but it is generally offered to ſale in the form of powder, which is very often mixed with chalk or gypſum. The fraud is eaſily detected by expoſing it to heat. The arſenious acid is entirely ſublimed, and the additions remain behind.

As this ſubſtance is one of the moſt virulent poiſons, we ſhall give a full account of its properties. It is white, compact, brittle, and of a glaſſy appearance. Its taſte is ſweetiſh, but acrid, and ſlow in manifeſting itſelf. It ſublimes entirely when expoſed to 283° Fahrenheit. When the operation is performed in cloſe veſſels, the arſenious acid aſſumes a glaſſy appearance, which it ſoon loſes on expoſure to the air. In open veſſels it ſublimes in denſe white fumes, ſmelling ſtrongly of garlic. If a plate of copper be expoſed to the fumes, it is whitened. Arſenious acid is ſoluble in 80 parts of water at 60°, and in 15 at 212°. This ſolution has an acrid taſte, and reddens vegetable blues. It is alſo ſoluble in 80 parts of boiling alcohol. From either ſolution it may be obtained regularly cryſtallized in tetrahedrons. From its ſolutions a graſs-green precipitate is ſeparated by a ſolution of ſulphate of iron, a white precipitate by lime-water, and a yellow precipitate by any of the combinations of an alkali with ſulphur, or with ſulphur and hydrogen. All theſe precipitates, when expoſed to a ſufficient temperature, ſublime entirely, and emit the ſmell of garlic. When treated with nitric acid, the arſenious acid is converted into arſenic acid. But by far the ſureſt teſt of the preſence of arſenic, is its reduction by carbonaceous ſubſtances. With this view, a ſmall quantity of any ſuſpected ſubſtance may be mixed with ſome fatty or oily matter, and introduced within a tube cloſed at the bottom, and expoſed to a red heat; if arſenic be preſent in any ſtate, it will be ſublimed in the form of brilliant metallic ſcales.

Arſenious acid is uſed by the dyers, as a flux in glaſs-making, in docimaſtic works, and in ſome glazes. Arſenious ſulphurets are much uſed by painters, but theſe advantages are not able to compenſate for its bad effects. In mines, it cauſes the deſtruction of numbers who explore them; being very volatile, it forms a duſt, which affects and deſtroys the lungs, and the unhappy

miners, after a languiſhing life of a few years, all periſh ſooner or latter. The property which it poſſeſſes of being ſoluble in water, increaſes and facilitates its deſtructive power; and it ought to be proſcribed in commerce, by the ſtrict law which prohibits the ſale of poiſons to unknown perſons. Arſenious acid is every day the inſtrument by which victims are ſacrificed, either by the hand of wickedneſs or imprudence. It is often miſtaken for ſugar, and theſe miſtakes are attended with the moſt dreadful conſequences. The ſymptoms which characterize this poiſon are, a great conſtriction of the throat, the teeth ſet on edge, and the mouth ſtrongly heated, an involuntary ſpitting, with extreme pains in the ſtomach, vomiting of glairy and bloody matter, with cold ſweats and convulſions.

On diſſection, the ſtomach and bowels are found to be inflamed, gangrenous, and corroded, and the blood is fluid. Soon after death, livid ſpots appear on the ſurface of the body, the nails become blue, and often fall off along with the hair, the epidermis ſeparates, and the whole body becomes very ſpeedily putrid. When the quantity is ſo very ſmall as not to prove fatal, tremors, palſies, and lingering hectics ſucceed.

Mucilaginous drinks have been long ago given to perſons poiſoned by arſenic. Milk, fat, oils, and butter, have been ſucceſſively employed. M. Navier has propoſed a more direct counterpoiſon. He preſcribes one drachm of ſulphuret of potaſs to be diſſolved in a pint of water, which the patient is directed to drink at ſeveral draughts; the ſulphur unites to the arſenic, and deſtroys its cauſticity and effects. When the firſt ſymptoms are alleviated, he adviſes the uſe of ſulphureous mineral waters. He likewiſe approves the uſe of milk, but condemns oils. Vinegar, which diſſolves arſenic, has been recommended by M. Sage, but upon what grounds we know not.

According to Hahneman, a ſolution of ſoap is the beſt remedy. One pound of ſoap may be diſſolved in four pounds of water, and a cupful of this ſolution may be drunk lukewarm every three or four minutes.

Medical uſe.—Notwithſtanding, however, the very violent effects of arſenious acid, it has been employed in the cure of diſeaſes, both as applied externally, and as taken internally.

Externally it has been chiefly employed in caſes of cancer.

Juſtamond uſed an ointment compoſed of four grains of white oxide of arſenic, ten grains of opium, and a drachm of cerate, and ſpread very thin upon linen. But its action is tedious. He alſo fumigated cancerous ſores with ſulphuret of arſenic, with a view to deſtroy their intolerable fetor, with great ſucceſs. Le Febure waſhed cancerous ſores frequently, in the courſe of the day, with

a ſolution of four grains of arſenious acid in two pounds of water. Arneman recommends an ointment of one drachm of arſenious acid, the ſame quantity of ſulphur, an ounce of diſtilled vinegar, and an ounce of ointment of white oxide of lead, in cancerous, and obſtinate ill-conditioned ſores, and in ſuppurated ſcrofulous glands. The arſenious acid has even been applied in ſubſtance, ſprinkled upon the ulcer. But this mode of uſing it is exceſſively painful, and extremely dangerous. There have been even fatal effects produced from its abſorption.

The principal thing to be attended to in arſenical applications is to diminiſh their activity to a certain degree. They then cauſe little irritation or pain, but rather excite a gentle degree of inflammation, which cauſes the diſeaſed parts to be thrown off, as if they were foreign ſubſtance, while they have the peculiar advantage of not extending their operation laterally.

No other eſcharotic poſſeſſes equal powers in cancerous affections; but, unfortunately, its good effects often do not go beyond a certain length, and if in ſome caſes it effects a cure, in others it muſt be allowed it does harm. While it has occaſioned very conſiderable pain, it has given the parts no diſpoſition to heal, the progreſs of the ulceration becoming even more rapid than before.

Internally it may be exhibited in the form,

1. Of arſenious acid diſſolved in diſtilled water, in the proportion of four grains to a pint. A table ſpoonful of this ſolution, mixed with an equal quantity of milk, and a little ſyrup of poppies, is directed to be taken every morning faſting, and the frequency of the doſe gradually increaſed until ſix table ſpoonfuls be taken daily. M. Le Febure's method of curing cancer.

2. Of arſenite of potaſs. Sixty-four grains of arſenious acid, with an equal quantity of carbonate of potaſs, are to be boiled together until the arſenious acid be diſſolved, when as much water is to be added as will increaſe the ſolution to one pound. Of this, from two to twelve drops may be given once, twice, or oftener, in the courſe of a day. Dr. Fowler's method of curing intermittent fever.

3. Of arſeniate of potaſs. Mix well together equal quantities of nitrate of potaſs, and of pure arſenious acid; put them into a retort, and diſtil at firſt with a gentle heat, but afterwards with ſo ſtrong a heat as to redden the bottom of the retort. In this proceſs the nitric

acid is partly decompofed, and paffes over into the receiver in the ftate of nitrous acid. The arfenious acid is at the fame time converted into arfenic acid, and combines with the potafs. The product, which is arfeniate of potafs, is found in the bottom of the retort, and may be obtained in the form of cryftals, of a prifmatic figure, by diffolving it in diftilled water, filtering the folution through paper, evaporating and cryftallizing. A preparation of M. Maquer's.

4. Arfenious acid, in fubftance, to the extent of an eighth of a grain for a dofe, combined with a little fublimed fulphur, has been faid to be exhibited in fome very obftinate cafes of cutaneous difeafes, and with the beft effect.

Notwithftanding the fuccefsful exhibition of arfenic by Dr. Fowler and other eminent practitioners, and notwithftanding its daily ufe as a domeftic remedy in the fenny parts of England and other countries, for the cure of intermittent fevers, it is fufpected on fuch ftrong grounds of undermining the conftitution, and laying the foundation for mortal difeafes, that its general ufe ought to be difcouraged. The French directory were, however, of a different opinion, when they publifhed an edict ordering the furgeons of the Italian army to free the numberlefs foldiers who were feized with agues in the marfhes of Lombardy, of their complaints, in the courfe of two or three days, and at the expence of as many fous, under the pains of military punifhment.

ARTEMISIA.—*Will. g.* 1473. *Syngenefia Polygamia fuperflua.*—Nat. ord. *Compofitæ difcoideæ.*

Sp. 8. ARTEMISIA ABROTANUM. *Abrotanum. Lond.* Southernwood.

Off.—Folium. The leaves.

THIS is a perennial fhrub, which grows readily in our gardens, though a native of the fouth of Europe.

Southernwood has a ftrong fmell, which, to moft people, is not difagreeable; it has a pungent, bitter, and fomewhat naufeous tafte. Thefe qualities are very completely extracted by alcohol, and the tincture is of a beautiful green colour. They are lefs perfectly extracted by watery liquors, the infufion being of a light brown colour.

Med. ufe.—Southernwood, as well as fome other fpecies of the fame genus, has been recommended as an anthelmintic; and it has alfo been fometimes ufed as ftimulant, detergent, and fudorific. Externally, it has been employed in difcutient and antifep-

tic fomentations; and under the form of lotion and ointment for cutaneous eruptions, and for preventing the hair from falling off. But it is at preſent very rarely uſed in any way.

Off. prep.—Decoct. pro foment. *Lond.*

Sp. 42. ARTEMISIA MARITIMA. *Abſinthium Maritimum. Lond. Dub.*

Sea Wormwood.

Off.—Cacumina. The tops.

THIS ſpecies of artemiſia is perennial and herbaceous. It grows wild in ſalt marſhes, and in ſeveral parts about the ſea-coaſts. In taſte and ſmell it is weaker and leſs unpleaſant than the common wormwood, and is now almoſt rejected from practice.

Off. prep.—Decoct. pro foment. *Lond.* Conſerv. *Lond.*

Sp. 26. ARTEMISIA SANTONICA. *Ed. Santonicum. Lond. Dub.*

Wormſeed.

Off.—Cacumen, ſemen. The tops, the ſeeds.

ALL the Britiſh colleges have given this ſpecies as the plant which produces theſe ſeeds, but the fact is by no means aſcertained. They have been aſcribed by different writers to other ſpecies of the ſame genus, the Judaica, the Contra, and the Auſtriaca, and are even ſaid by Saunders to be the produce of a ſpecies of Chenopodium.

The ſeeds themſelves are ſmall, oblong, ſmooth, and of a greeniſh or greyiſh yellow colour. As the whole head is gathered after the ſeeds are ripe, they are mixed with the ſcales of the calices and bits of ſtalks. Their taſte is bitter, and ſomewhat acrid; their ſmell ſtrong and diſagreeable. Thoſe which come from Aleppo are eſteemed the beſt, and thoſe from Barbary the worſt. When they have no ſmell, and a leſs intenſely bitter taſte, and are diſcoloured, and mixed with a longer kind of ſeed, they are to be rejected. They are alſo adulterated with the ſeeds of tanſy and wormwood. The latter are eaſily known, by having a light yellow colour, and reſembling powdered hay more than ſeeds. Neumann obtained from 480 parts 213 of alcoholic extract, and 110 watery; and inverſely, 260 watery, and 28 alcoholic. It gave a ſlight flavour to water diſtilled from it, but no oil.

Med. uſe.—Wormſeed is one of the oldeſt and moſt common anthelmintics, eſpecially in the lumbrici of children. On account of their eſſential oil, they are heating and ſtimulating.

They are given to children,

1. In ſubſtance, to the extent of ten grains, or half a drachm, finely powdered, and ſtrewed on bread and butter; or

made into an electuary with honey or treacle; or candied with ſugar; or diffuſed through milk, and taken in the morning when the ſtomach is empty.

2. In infuſion or decoction, but to theſe forms their bitterneſs is a ſtrong objection.

After they have been uſed for ſome days, it is cuſtomary to give a cathartic, or they are combined from the beginning with rhubarb, jalap, calomel, ſulphate of iron, or muriate of ammonia.

Sp. 63. ARTEMISIA ABSINTHIUM. *Ed.* *Abſinthium vulgare. Lond. Dub.*

Common wormwood.

Off.—Folium, ſummitas florens. The herb, leaves, and flowering heads.

THIS perennial herb grows by the road ſides, and on rubbiſh, in many parts of Britain; and about London it is cultivated for medical uſe. Its ſmell is ſtrong and diſagreeable; its taſte intenſely bitter. Its active conſtituents are bitter extractive and eſſential oil. It is uſed in ſtomach complaints, and is of great ſervice to hypochondriſts. It is alſo employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and againſt worms. Many perſons cannot ſuffer the diſagreeable ſmell of wormwood, which is apt to occaſion headach, but it may be freed from it in a great meaſure by decoction. The extract is a pure and ſimple bitter. The eſſential oil is of a dark green colour, and contains the whole flavour of the plant. It is ſtimulating, and is ſuppoſed to be a powerful antiſpaſmodic and anthelmintic. It was formerly much uſed for the preparation of medicated wine and ales.

ARUM MACULATUM. *Arum. Lond. Dub.*

Wake-robin.

Off.—Radix recens. The recent root.

Gynandria Polyandria.—Nat. ord. *Piperitæ.*

THIS is a perennial ſolid bulbous-rooted plant, which grows wild in ſhady ſituations, and by the ſides of banks, in many parts of Britain. The root is knotty, roundiſh, and white. When collected in ſpring, before the leaves ſhoot, or in autumn, after flowering, it contains a milky juice, of very great acrimony. Applied to the tongue, it cauſes a burning heat, which laſts for many hours, and excites conſiderable thirſt. Theſe diſagreeable ſymptoms may be relieved by butter-milk or oily fluids. Rubbed between the fingers, it bliſters and excoriates them; it is there-

fore a corrofive vegetable poifon. By drying, it lofes the greateſt part of its acrimony, and becomes fimply amylaceous. It is alfo rendered perfectly mild by frequent wafhing with water. Its acrimony is therefore eafily deftructible; and as it does not arife from the prefence of an effential oil, it depends upon a vegetable principle, different from all others, and not well underftood. It does not rife in diftillation, either with alcohol or with water, and is not contained in its extract, although the root is thereby deprived of it. Neumann obtained from 480 of the dry root 20 of alcoholic extract, and about 180 watery. The former had fome flight pungency, the latter none.

Medical ufe.—In the recent root, the degree of acrimony is fo very uncertain, and often fo exceffive, that its effects, as an internal remedy, cannot be depended on. The dried root is perfectly inert; but the roots may be kept frefh for a year, by burying them in a cellar in fand.

Off prep.—Conferv. *Lond.*

ASARUM EUROPÆUM. *Ed.* *Afarum. Dub. Lond.*
Afarabacca.

Off.—Folium. The leaves.

Willd. g. 925. *fp.* 1. *Dodecandria Monogynia.*—Nat. ord. *Sarmentaceæ.*

This is a perennial plant, which is a native of fome places of England, although the dried roots are generally brought from the Levant. It grows in moift and fhady fituations. It produces only two leaves, which are uniform and very obtufe. The root is fibrous, of a grey-brown colour externally, but white within. Both the roots and leaves have a naufeous, bitter, acrimonious, hot tafte; their fmell is ftrong, and not very difagreeable.

In its analyfis, it is faid by Neumann to agree with ipecacuanha, but it feems to contain, befides its odorous principle, which is probably camphor, a portion of the fame acrid principle which has been noticed when fpeaking of arum. Upon this its virtues depend; and as this principle is volatile, we find accordingly that afarabacca lofes much of its activity by decoction and long keeping.

Given in fubftance from half a drachm to a drachm, it evacuates powerfully both upwards and downwards. It is faid, that tinctures made in fpiritous menftrua, poffefs both the emetic and cathartic virtues of the plant: that the extract obtained by infpiffating thefe tinctures acts only by vomiting, and with great mildnefs! that an infufion in water proves cathartic, rarely emetic: that aqueous decoctions made by long boiling, and the wa-

tory extract, have no purgative or emetic quality, but prove good diaphoretics, diuretics, and emmenagogues.

The principal use of this plant among us is a sternutatory. The root of asarum is perhaps the strongest of all the vegetable errhines, white hellebore itself not excepted. Snuffed up the nose, in the quantity of a grain or two, it occasions a large evacuation of mucus, and raises a plentiful spitting. The leaves are considerably milder, and may be used to the quantity of three, four, or five grains. Geoffroy relates, that after snuffing up a dose of this errhine at night, he has frequently observed the discharge from the nose to continue for three days together; and that he has known a paralysis of the mouth and tongue cured by one dose. He recommends this medicine in stubborn disorders of the head, proceeding from viscid tenacious matter, in palsies, and in soporific distempers.

Off. prep.—Pulv. comp. *Ed. Lond. Dub.*

ASTRAGALUS TRAGACANTHA. *Ed.* *Tragacantha. Lond. Dub.*

Tragacanth.

Off.—Gummi. Gum Tragacanth.

Willd. g. 1379. *sp.* *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ.*

Gum Tragacanth is the produce of a very thorny shrub, which grows on the island of Candia, and other places in the Levant.

About the end of June a fluid exudes from the stem and larger branches, which dries in the sun, and is collected by the shepherds on Mount Ida, from whence it is sent to Europe, under the title of Tragacanth.

It consists of whitish semi-transparent vermiform pieces, scarcely a line in thickness, without taste or smell.

There is also a dirty yellow, or brownish kind, which is not fit for medical purposes.

Tragacanth is difficultly pulverizable, unless when thoroughly dried, and the mortar heated, or in frost. According to Neumann, it gives nothing over in distillation, either to water or alcohol: alcohol dissolves only about 10 parts of 480, and water the whole. Lewis, however, more accurately observes, that it cannot be properly said to be dissolved; for, put into water, it absorbs a large proportion of that fluid, increasing immensely in volume, and forming with it a soft, but not fluid, mucilage; and although it is easily diffused through a larger proportion of water, after standing a day or two, the mucilage subsides again, the supernatant fluid retaining little of the gum.

Besides these remarkable differences from gum-arabic in regard to brittleness, insolubility, and the quantity of water which it thickens, I find that tragacanth is not precipitated by silicized potass, and is precipitated by sulphate of copper and acetate of lead.

In pharmacy it is employed for forming powders into troches, and rendering tough cohesive substances, such as colocynth, pulverizable, by beating them with mucilage of tragacanth, and then drying the mass. For electuaries it is improper, as it renders them slimy on keeping.

Off. prep.—Pulv. comp. *Lond.* Pulv. cerussæ comp. *Lond.* Mucilago, *Ed. Lond. Dub.* Trochisci glycyrr. *Lond. Dub.* Trochisci nitri, *Lond.*

ATROPA BELLADONNA. *Ed.* *Belladonna. Dub.* *Solanum lethale.*

Deadly nightshade.

Willd. g. 381. *sp.* 2. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

Off.—Folium. The leaf.

The deadly nightshade is a perennial plant, with a herbaceous stem, which is indigenous both in mountainous and woody situations in this country, and often cultivated in gardens. The whole plant is poisonous, and the berries, from their beautiful appearance, have sometimes proved fatal to children. The symptoms excited are, a dryness of the mouth, a trembling of the tongue, a very distressing thirst, a difficulty of swallowing, fruitless efforts to vomit, and great anxiety about the præcordia. Delirium then comes on, with gnashing of the teeth, and convulsions. The pupil remains dilated, and is not sensible even to the stimulus of light. The face becomes tumid, and of a dark-red colour. The jaws are frequently locked. Inflammation attacks the œsophagus, stomach, and intestines, sometimes extending to the mesentery, lungs, and liver, accompanied with violent pains in the abdomen. The stomach is very insensible to stimulus, and the peristaltic motion of the intestines is destroyed. General relaxation, palsy, especially of the lower extremities, convulsions, vertigo, blindness, coma, and death succeed. The body soon putrifies, swells, and becomes marked with livid spots; blood flows from the nose, mouth, and ears, and the stench is insufferable. On dissection the blood is found to be fluid, the intestines are inflated and inflamed, or eroded and gangrenous. The best method of cure is to excite vomiting as soon as possible, by emetics, and tickling the fauces; to evacuate the bowels by purgatives and glysters; and to give, largely, vinegar, honey,

milk, and oil. In ſome children who recovered by this treatment, the delirium was ſucceeded by a profound ſopor, accompanied with ſubſultus tendinum; the face and hands became pale and cold, and the pulſe ſmall, hard, and quick. Their recovery was ſlow, and the blindneſs continued a conſiderable time, but at laſt went off.

By diſtillation in the vapour bath, Geoffroy procuredfrom the recent leaves a ſlightly acrid liquor, and the reſiduum by deſtructive diſtillation yielded carbonate of ammonia.

Medical uſe.—Yet this virulent poiſon, under proper management, may become an excellent remedy. Beſides its narcotic power, it promotes all the excretions; but its exhibition requires the greateſt caution; for it is apt, when continued for any length of time, even in ſmall doſes, to cauſe dryneſs and tenſion of the throat and neighbouring parts, vertigo, dimneſs of ſight, and even temporary blindneſs. When any of theſe ſymptoms occur, its uſe muſt be ſuſpended for ſome time, and afterwards reſumed in ſmaller doſes.

Deadly nightſhade has been exhibited,

1. In ſeveral febrile diſeaſes; in obſtinate intermittents; and in the plague.
2. In inflammations; the gout.
3. In comatoſe diſeaſes; in palſy, and loſs of ſpeech from apoplexy.
4. In ſpaſmodic diſeaſes; in chorea, epilepſy, chincough, hydrophobia, melancholy, and mania.
5. In cachectic affections; in dropſies, and obſtinate jaundice.
6. In local diſeaſes; in amauroſis, ophthalmia, in ſchirrhus, and cancer.

Deadly nightſhade is beſt exhibited in ſubſtance, beginning with a very ſmall doſe of the powdered leaves or root, ſuch as the fourth or eighth part of a grain for children, and one grain for adults, to be repeated daily, and gradually increaſed. In hydrophobia, Münch gave the powdered root every ſecond morning, to the extent of from one to five grains to children, and fourteen or fifteen grains to adults.

The watery infuſion is alſo a powerful remedy. One ſcruple of the dried leaves are infuſed in ten ounces of warm water, and ſtrained after cooling. At firſt two ounces of this may be given daily to adults, and gradually increaſed, until the tenſion of the throat ſhews that it would be imprudent to go farther.

The watery extract is not a judicious preparation.

Externally, the powdered leaves are applied as a narcotic to diminiſh pain, and to cancerous and ill-conditioned ſores. From its effect, in permanently dilating the pupil, Profeſſor Reimarus propoſed, and tried with ſucceſs, the dropping a little of the infuſion into the eye, a few hours before performing the operation for the cataract, with the view of facilitating the operation.

Off. prep.—Succ. ſpiſſ. atrop. bell. *Ed.*

AVENA SATIVA. *Ed.* *Avena. Lond.*

Willd. g. 142. *ſp.* 13. *Triandria Digynia.*—Nat. ord. *Gramina.*

Oats.

Off.—Semen. The ſeed.

This is a well known annual plant, which is very generally cultivated in northern countries, and in many places furniſhes their principal ſubſiſtence. When ſimply freed from the huſks, this grain gets the name of groats, but it is more frequently ground into meal. Groats are made into broths. Oat-meal is baked with ſalt and water into cakes, or with the ſame additions, is boiled to form porridge. An infuſion of the huſks in water, allowed to remain till it become acidulous, is boiled down to a jelly, which is called ſowins. In all theſe forms it is nutritious, and eaſy of digeſtion.

Med. uſe.—Gruels or decoctions, either of groats or oat-meal, either plain or acidified, or ſweetened, form an excellent drink in febrile diſeaſes, diarrhœa, dyſentery, &c. and from their demulcent properties, prove uſeful in inflammatory diſorders, coughs, hoarſeneſs, roughneſs, and exulcerations of the fauces. Porridge is alſo frequently applied to phlegmenous ſwellings, to promote their ſuppuration.

BERBERIS VULGARIS. *Berberis. Dub.*

Barberry.

Off.—Fructus. The fruit.

Willd. g. 677. *ſp.* 1. *Hexandria Monogynia.*—Nat. ord. *Tribilatæ.*

The barberry is a ſmall tree, or rather a large buſh, covered with an aſh-coloured bark, under which is contained another of a deep yellow: the berries are of an elegant red colour, and contain each two hard brown ſeeds. It grows wild on chalky hills in ſeveral parts of England; and is frequently planted in hedges and in gardens.

The outward bark of the branches and the leaves have an aſtringent acid taſte: the inner yellow bark a bitter one. This laſt is ſaid to be ſerviceable in the jaundice; and by ſome to be an uſeful purgative.

The berries contain a very acid red juice, which confifts chiefly of malic acid. This juice forms a ufeful and pleafant addition to antiphlogiftic drinks, in fluxes, and malignant fevers, for abating heat, quenching thirft, raifing the ftrength, and preventing putrefaction. They alfo form a very elegant fyrup or preferve, which may be employed with advantage in the fame difeafes.

BETULA ALBA. *Dub.*

The birch tree.

Off.—Succus. The juice.

Monœctia Tetandria.—Nat. ord. *Amentaceæ.*

THIS tree grows wild in moft woods: its bark is aftringent.

Upon deeply wounding or boring the trunk of the tree in the beginning of fpring, a fweetifh juice iffues forth, fometimes, it is faid, in fo large a quantity as to equal in weight the whole tree and root: one branch will bleed a gallon or more in a day. This juice is chiefly recommended in fcorbutic and fimilar diforders: its moft fenfible effect is to promote the urinary difcharge.

BITUMEN PETROLEUM. *Ed.* *Petroleum. Lond.* *Petroleum Barbadenfe. Refina. Dub.*

Rock oil. Barbadoes tar.

BITUMEN is now employed as the generic name for feveral inflammable bodies of different degrees of confiftency, from perfect fluidity to that of a brittle but very fufible folid, and of little fpecific gravity. They are infoluble in alcohol or in water, combine with effential oils and fulphur, decompofe only a fmall proportion of nitrate of potafs by deflagration, and on inflammation leave little or no refiduum.

Sp. 1. NAPHTHA. It is nearly as colourlefs, tranfparent, and fluid as water. Specific gravity 0.729 to 0.847, of a highly penetrating, yet not difagreeable fmell, fomewhat like that of rectified oil of amber, very volatile, and remaining fluid at 0° Fahrenheit.

Sp. 2. PETROLEUM. Not fo fluid, tranfparent, or colourlefs, as the former; fmell lefs pleafant. Specific gravity 0.878.

Sp. 3. MINERAL TAR. Vifcid; of a dark colour; fmell fometimes ftrong, but often faint. Specific gravity 1.1.

Sp. 4. MINERAL PITCH,—Maltha. Brittle in cold weather; of a dark colour; opaque. Specific gravity probably 1.07.

Sp. 5. ASPHALTUM. Very brittle; fracture conchoidal; glaffy luftre; no fmell, unlefs when melted or heated. Specific gravity 1.07 to 1.65. Fufible and inflammable.

According to Mr. Kirwan and Mr. Hatchett, the firft fpecies, by expofure to the air, and gradual decompofition, paffes fucceff-

ively through the intermediate ftates, till at laft it is converted into afphaltum. When partially decompofed, the remaining naphtha may be feparated by diftillation from the fuperabundant charcoal.

From the different pharmacopœias having been publifhed before the fpecific characters were properly afcertained, there is fome confufion with regard to the fpecies which is officinal. The London college name the fecond, and the Dublin college the third; but the latter err greatly in calling it a refin; while the Edinburgh college incorrectly give petroleum Barbadenfe, which belongs to the third fpecies, as a fynonime of bitumen petroleum, which is the fecond. The firft fpecies is found abundantly in Perfia; but what we receive comes from the duchy of Modena in Italy. It is very rarely met with in the fhops; the fecond, mixed with a little of the third, and fome fubtile oil, is ufually fent us inftead of it.

Medical ufe.—Petroleum is at prefent very rarely employed as a medicine; though, if the finer kinds could be procured genuine, they feem to deferve fome notice. They are more agreeable than the oil of amber, and milder than that of turpentine, of the virtues of both of which they participate. They are principally recommended by authors for external purpofes, againft pains and aches, in paralytic complaints, and for preventing chilblains. For thefe intentions, fome of the more common mineral oils have been made ufe of with good fuccefs. An oil extracted from a kind of ftone coal has been extolled among the common people, under the name of Britifh oil, for rheumatic pains, &c.; even this is often counterfeited by a fmall portion of oil of amber added to the common expreffed oils.

The Barbadoes tar is found in feveral of the Weft-India iflands, where it is efteemed by the inhabitants of great fervice as a fudorific, and in diforders of the breaft and lungs; though in cafes of this kind, attended with inflammation, it is certainly improper; they likewife apply it externally as a difcutient, and for preventing paralytic diforders.

Off. prep.—Ol. petrolei, *Lond.* Petrol. fulph. *Lond.*

BOLETUS IGNIARIUS. *Ed.* *Agaricus chirurgorum. Off.*
Cryptogamia Fungi.—Nat. ord. *Fungi.*

Female agaric, or agaric of the oak, called, from its being very eafily inflammable, Touchwood, or Spunk.

This fungus is frequently met with on different kinds of trees in Britain, efpecially the cherry and plumb; and is faid to have been fometimes brought into the fhops mixed with the true agaric of the larch: from this it is eafily diftinguifhable, by its greater

weight, dufky colour, and mucilaginous tafte void of bitternefs. The medullary part of this fungus, beaten foft, and applied externally, has been much celebrated as a ftyptic; and faid to reftrain not only veinous, but arterial hæmorrhagies, without the ufe of ligatures. It does not appear, however, to have any real ftyptic power, or to act any otherwife than dry lint, fponge, or other foft fungous applications. It is beft when gathered in Auguft or September.

BOLUS GALLICUS. *Lond.*

French Bole.

Boles are earthy aggregates, confifting chiefly of filiceous and argillaceous earths. They are lefs coherent and more friable than pure clay, more eafily diffufed through water, and more freely fubfiding from it. They feel greafy to the touch, adhere flightly to the tongue, and break down in the mouth, impreffing a light fenfe of aftringency. A great variety of thefe fubftances were formerly ufed in medicine, but the French bole alone is now retained in the London Pharmacopœia. It is of a pale red colour, variegated with irregular fpecks or veins of white and yellow.

Thefe earths have been recommended as aftringent, fudorific, and alexipharmic; and they have been ufed in diarrhœas, dyfenteries, hæmorrhagies, and in malignant and peftilential diftempers. In inteftinal fluxes, and complaints in the firft paffages, from thin acrimonious humours, they may doubtlefs be of fome ufe: but the virtues afcribed to them in the other cafes appear to have no foundation.

BRYONIA ALBA. (*B. Dioica; Jacquin, Withering.*) *Bryonia. Radix. Dub.*

Bryony; wild vine. The root.

Monœcia Syngenefia.—Nat. ord. *Cucurbitacæ.*

This is an indigenous perennial plant, growing on dry banks, under hedges, and climbing upon the bufhes. The roots are large, fometimes as thick as a man's thigh; their fmell, when frefh, is ftrong and difagreeable; the tafte naufeoufly bitter, acrid, and biting; the juice is fo fharp as in a little time to excoriate the fkin: in drying they lofe great part of their acrimony, and almoft the whole of their fmell.

Neumann obtained by expreffion from a pound of the frefh root nearly fix ounces of juice, retaining a great deal of the naufeous fmell and tafte of the root, and depofiting, on ftanding, a white powdery amylaceous matter, (fæcula bryoniæ) recommended as a milder purgative than the root. 960 parts of the dry root yielded to water 606, and afterwards to alcohol 23. Alcohol, when applied firft, extracted 170, and water afterwards 250.

Medical use.—Bryony root is a ſtrong irritating cathartic; and as ſuch has ſometimes been ſucceſsfully exhibited in maniacal caſes, in ſome kinds of dropſies, and in ſeveral chronical diſorders. An extract prepared by water acts more mildly, and with greater ſafety, than the root in ſubſtance; given from half a drachm to a drachm, it is ſaid to prove a gentle purgative, and likewiſe to operate powerfully by urine. The freſh root, applied externally, is ſaid to be a powerful diſcutient in œdematous ſwellings.

BUBON GALBANUM. *Ed.* *Syn. Galbanum.* *Lond. Dub.* *Willd. g.* 546, *ſp.* 2.—*Pentandria Digynia*—Nat. ord. *Umbellatæ.* *Off.*—Gummi-reſina. Galbanum, a gum-reſin.

THIS plant is perennial, and grows in Africa. It abounds with a milky juice, which ſometimes exudes from the joints of the old plants, but is more frequently obtained by cutting them acroſs ſome inches above the root. The juice which flows from the wound ſoon hardens, and is the galbanum which is brought to us from Syria and the Levant.

The beſt ſort of galbanum conſiſts of pale-coloured pieces, about the ſize of a hazel nut, which, on being broken, appear to be compoſed of clear white tears, of a bitteriſh acrid taſte, and a ſtrong peculiar ſmell. But it moſt commonly occurs in agglutinated maſſes, compoſed of yellowiſh or reddiſh and clear white tears, which may be eaſily torn aſunder, of the conſiſtence of firm wax, ſoftening by heat, and becoming brittle by cold, and mixed with ſeeds and leaves. What is mixed with ſand, earth, and other impurities, and is of a brown or blackiſh colour, interſperſed with no white grains, of a weak ſmell, and of a conſiſtence always ſoft, is bad.

Galbanum is almoſt entirely ſoluble in water, but the ſolution is milky; neither do wine nor vinegar diſſolve it perfectly. Alcohol, according to Hagen, has very little action upon it. It is not fuſible: but furniſhes a conſiderable proportion of eſſential oil when diſtilled with water. Neumann obtained by diſtillation with water ſix drachms of oil, beſides what was diſſolved in the water. The watery extract amounted to about three ounces. It had ſomewhat of a nauſeous reliſh, but could not have been recognized as a preparation of galbanum. From the ſame quantity alcohol extracted upwards of nine ounces and a half of a hard brittle inſipid inodorous ſubſtance (reſin ?).

Medical uſe.—Galbanum agrees in virtue with gum ammoniacum; but is generally accounted leſs proper in aſthmas, and more ſo in hyſterical complaints. It is exhibited in the form of pills or

emulsion, to the extent of about a drachm. Applied externally, it is supposed to resolve and discuss tumours, and to promote suppuration.

Off. prep.—Galb. purif. Pil. g. comp. *Lond.* Pil. assæ fœt. comp. *Ed.* Tinct. galb. *Lond.* Emplast. picis burgund. *Dub.* E. assæ fœtid. *Ed.* E. gummos, *Ed.* E. lith. comp. *Lond.*

CALX. *Lond.* *Calx viva. Ed. Calx recens usta.* *Dub.*

a. Ex lapide calcareo.

b. Ex testis conchyliorum.

Quicklime recently burnt.

LIME is a simple substance, the properties of which have been already enumerated. It is scarcely found in nature uncombined, but is easily prepared from any of its carbonates, either mineral or animal, by the action of fire, which first expels the water, then destroys any animal matters which may be present, and, lastly, expels the carbonic acid. This process is improperly termed the burning of lime. The product is lime, or, as it is commonly called, quicklime.

If about half its weight of water be poured upon lime, a great increase of temperature takes place, steam is produced, and the lime crumbles down into a dry powder, somewhat increased in weight by the presence of part of the water, which has been solidified by the lime: and to the caloric of fluidity, which is expelled during the conversion of the water into a solid, the great increase of the temperature is owing. Lime in this state is said to be slacked. If more water be poured upon slacked lime, there is no new evolution of caloric; but if the water amount to 700 times the weight of the lime, the lime is completely dissolved. This solution is termed Lime-water.

As lime quickly attracts moisture and carbonic acid from the atmosphere, it should be always recently prepared; and when kept, it should be preserved in very close bottles. Lime should not effervesce with acids, and should be entirely soluble in water.

Medical use.—On the living body lime acts as an escharotic, and as such it was formerly applied to ill-conditioned and obstinate sores. Dissolved in water, it is sometimes given internally as a tonic or astringent in scrophula and various fluxes, and formerly it enjoyed considerable reputation as a lithontriptic.

Off. prep.—Aqua calcis, *Ed. Lond. Dub.* Aqua potassæ, *Ed. Lond. Dub.* Aqua ammoniæ, *Ed. Lond. Dub.* Alcohol ammon. *Ed.*

CANCER. *Chelæ. Lond.* *Calculi oculi dicti; Chelæ. Dub.*

The crab. A genus of crustaceous insects.

Sp. CANCER ASTACUS. *Lapilli. Ed.*

The craw-fiſh. Crabs ſtones, vulgarly called Crabs eyes.

CRABS ſtones are generally about the ſize of peas, or larger; ſomewhat hemiſpherical in their ſhapes, and laminated in their texture; of a white colour; but ſometimes reddiſh or bluiſh.

Theſe concretions are found in the ſtomach, one on each ſide, at the time when the crab changes its ſhell, and alſo renews the inner membrane of the ſtomach, which commonly happens in the month of Auguſt. They afterwards gradually diſappear, and no ſtones are found after the new ſhell has acquired its full degree of firmneſs. They therefore ſeem to furniſh the materials for the induration of the new ſhell. They are brought in great numbers from Poland and Ruſſia, eſpecially from the province of Aſtracan, where the craw-fiſh are either bruiſed with wooden mallets, or laid up in heaps to putrify, when the fleſh is waſhed away with water, and the ſtones picked out.

They conſiſt of carbonate of lime, combined with a little phoſphate of lime and gelatine. The quantity of the two laſt is too ſmall, and their action on the living body too inconſiderable to make any conſiderable difference in medical properties, between theſe concretions and ſoft carbonate of lime, as it occurs in the mineral kingdom.

Crab ſtones are ſaid by moſt writers on the materia medica to be frequently counterfeited with tobacco-pipe clay, or compoſitions of chalk with mucilaginous ſubſtances. This piece of fraud, if really practiſed, may be very eaſily diſcovered: the counterfeits wanting the leafy texture which is obſerved upon breaking the genuine; more readily imbibing water; adhering to the tongue; and diſſolving in vinegar, or the ſtronger acids, diluted with water, either entirely, or not at all, or by piecemeal; whilſt the true crabs ſtones, digeſted in theſe liquors, become ſoft and tranſparent, their original form remaining the ſame, as the organization of the gelatine is not altered by the acid.

Off. prep.—Cancorum lapilli præparati. *Ed.*

Sp. CANCER PAGURUS. *Chelæ. Ed.*

The black-clawed crab. The claws.

THIS ſpecies of crab inhabits the ſea, and is found eſpecially in the North ſea. Its claws are yellow, tipt with black, and in every reſpect they reſemble the former article.

Off. prep.—Cancrorum chelæ ppt. *Lond. Dub.* Trochiſci cretæ, *Lond.* Pulv. chel. canc. comp. *Lond.*

CANELLA ALBA. *Lond. Ed. Dub.*

Willd. g. 942, *ſp.* 1. *Dodecandria Monogynia.*—Nat. ord. *Oleraceæ.*

Canella alba.

Off.—Cortex. The bark.

THE canella alba, or, as the Dublin college named it, the Winterania canella, is a tall tree, which is very common in Jamaica, and other Weſt-India iſlands.

The canella is the interior bark, freed from the epidermis, which is thin and rough, and dried in the ſhade. There are two ſorts of canella in the ſhops, differing from each other in the length and thickneſs of the quills: they are both the bark of the ſame tree, the thicker being taken from the trunk, and the thinner from the branches.

It is brought to us rolled up in long quills, thicker than cinnamon, and both outwardly and inwardly of a whitiſh colour, lightly inclining to yellow. It is a warm pungent aromatic, not of the moſt agreeable kind; nor are any of the preparations of it very grateful. It muſt not be confounded with the bark of the wintera aromatica.

Medical uſe.—Canella alba is ſometimes employed where a warm ſtimulant to the ſtomach is neceſſary, and is a corrigent of other articles. It is alſo uſeful as covering the taſte of ſome other articles.

Off. prep.—Tinct. gent. comp. *Ed.*

CAPSICUM ANNUUM. *Ed.* *Piper Indicum. Lond. Dub.* *Willd. g.* 384, *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

Cockſpur pepper.

Off.—Fructus, capſulæ. The pod.

THIS is an annual plant, a native of South America, but cultivated in large quantities in our Weſt-India iſlands; and it will even ripen its fruit in this climate.

The pods of this ſpecies are long, pointed, and pendulous, at firſt of a green colour, and afterwards of a bright orange red. They are filled with a dry looſe pulp, and contain many ſmall, flat, kidney-ſhaped ſeeds. The taſte of capſicum is extremely pungent and acrimonious, ſetting the mouth as it were on fire.

The principle on which its pungency depends, I find, is ſoluble in water and in alcohol, is not volatile, reddens infuſions of turnſole, and is precipitated by infuſion of galls, nitrate of mercury, muriate of mercury, nitrate of ſilver, ſulphate of copper, ſulphate of zinc, red ſulphate of iron (but not blue or green), ammonia, carbonate of potaſs, alum, but not by ſulphuric, nitric, or muriatic acid, or ſilicized potaſs.

Cayenne pepper is an indiſcriminate mixture of the powder of the dried pods of many ſpecies of capſicum, but eſpecially of the

capſicum fruteſcens or bird pepper, which is the hotteſt of all. Cayenne pepper, as it comes to us in powder from the Weſt Indies, changes infuſion of turnſole to a beautiful green, probably owing to the muriate of ſoda, which is always added to it, and red oxide of lead, with which it is ſaid to be mixed.

Medical uſe.—Theſe peppers have been chiefly uſed as a condiment. They prevent flatulence from vegetable food, and have a warm and kindly effect in the ſtomach, poſſeſſing all the virtues of the oriental ſpices, without, according to Dr. Wright, producing thoſe complaints of the head which the latter are apt to occaſion. An abuſe of them, however, is ſuppoſed to occaſion viſceral obſtructions, eſpecially of the liver. In the practice of medicine, they conſtitute one of the ſimpleſt and ſtrongeſt ſtimulants which can be introduced into the ſtomach; their action not being followed by any narcotic effects. Dr. Wright ſays, that in dropſical and other complaints, where chalybeates are indicated, a minute portion of powdered capſicum forms an excellent addition, and recommends its uſe in lethargic affections. It has alſo been ſucceſsfully employed as a gargle in cynanche maligna, reſiſting the uſe of cinchona, wine, and the other remedies commonly employed. In tropical fevers, coma and delirium are common attendants; and in ſuch caſes, cataplaſms of capſicum have a ſpeedy and happy effect. They redden the parts, but ſeldom bliſter, unleſs when kept on too long. In ophthalmia from relaxation, the diluted juice of capſicum is a ſovereign remedy. Dr. Adair gave ſix or eight grains for a doſe, made into pills, or prepared a tincture, by digeſting half an ounce of the pepper in a pound of alcohol, the doſe of which was one or two drachms diluted with water.

CARBO LIGNI. *Ed.*

Charcoal of wood.

Charcoal, as it is commonly prepared, is not a pure oxide of carbon, but contains alſo a notable proportion of hydrogen, from which it may be purified by expoſing it for ſome time to a ſtrong heat. Münch directs, that for medical uſe it be reduced to fine powder, and heated in a covered crucible as long as any flame appears on removing the cover, and until it be fully red. It is to be allowed to cool in the furnace, the upper layer of the powder to be removed, and the remainder to be ſealed accurately up in ounce phials.

Medical uſe—When the pneumatic pathology was in faſhion, and phthyſis and ſimilar diſeaſes were aſcribed to hyper-oxygenation of the ſyſtem, charcoal was ſtrongly recommended as a power-

ful disoxygenizing remedy, and cases of its successful employment are even recorded. From its acknowledged effects in correcting the putridity of animal substances, it is probable that the virtues ascribed to it of preventing the putrid eructations which take place in some kinds of dyspepsia are better founded. Ten grains may be given for a dose. As an external application, powdered charcoal has been recommended in the cure of inflammation from external causes, gangrene, and all descriptions of fetid ulcers. The good effects of charcoal, or burnt bread, used as a tooth powder, in correcting the bad smell which the breath sometimes acquires from carious teeth are undoubted.

Pharm. prep.—Murias baryta, *Ed.* In this place it will not be superfluous to notice the power ascribed to charcoal of purifying various fetid or discoloured fluids. Lowitz found that it destroyed the adventitious colour and smell of vinegar, carbonate of ammonia, tartaric acid, alcohol, super-tartrate of potass, and other salts, and that it prevented water from becoming putrid at sea, especially when assisted by a little sulphuric acid. Meat which has acquired a maukish, or even putrid, smell, is also said to be rendered perfectly sweet by rubbing it with powdered charcoal.

CARBONAS.

Carbonate is a generic name for the combinations of the carbonic acid with earths, alkalies, and metallic oxides.

The nature of these substances was totally unknown, until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were supposed to be simple bodies; and the fact of their acquiring new and caustic properties by the action of fire, was attempted to be explained, by supposing that the particles of the fire combined with them. Dr. Black, however, demonstrated by proofs which carried universal conviction along with them, that these bodies in their caustic state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonic is now given.

The most general character of the carbonates is, their effervescing violently when any of the stronger acids is poured upon them. This phenomenon is owing to these acids displacing, by their greater affinity, the carbonic acid, which flies off in the form of a gas.

The carbonates may be also deprived of their carbonic acid,

either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonic acid by combining with part of its oxygen, so that both the acid and the charcoal are converted into carbonic oxide gas.

The carbonates may be divided into three great families, the alkaline, the earthy, and the metallic.

Family 1. The alkaline carbonates have a urinous taste, tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2. The earthy carbonates are insipid, and insoluble in water, but soluble in water saturated with carbonic acid.

Family 3. The metallic carbonates scarcely differ in appearance from the metallic oxides.

We shall have immediately occasion to notice some individuals of each of these families.

CARBONAS BARYTÆ. *Ed.* *Barytes, Terra ponderosa.*
Carbonate of baryta, Barytes. Heavy spar.

CARBONATED BARYTA is rarely found in nature, and as it was first discovered by Dr. Withering, Mr. Werner gave it the name of Witherite. Its colour is greyish-white, sometimes inclining to milk white, and sometimes with a slight tinge of yellow, from a mixture of iron, seldom greenish, often invested with a red ochry crust. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or affecting that form, seldom crystallized. Texture, fibrous; fracture, conchoidal; fragments, long splinters; specific gravity, 4.3 to 4.338. Although it has no sensible taste, it is poisonous. In medicine it is only used for preparing the muriate of baryta. It is found at Anglesark in Lancashire, at Alstonmoor in Cumberland, in Scotland, and in Sweden, but is not common.

According to different analysis, its constituents are,

	Acid.		Baryta.		Water.
Withering,	20	+	80		
Pelletier,	22	+	62	+	16
Kirwan,	22	+	78		
Fourcroy,	10	+	90		

CARBONAS CALCIS. *Ed.* *Creta. Lond. Dub.*
Carbonated lime. Chalk.

THIS is the most common of all minerals, is found under a great variety of forms, and has various names, as chalk, limestone, marble, spar. In form it is either amorphous, stalactical, or

cryftallized. When amorphous, its texture is either foliated, ftriated, granular, or earthy. The primitive form of its cryftals is a rhomboidal parallelopiped. Hardnefs, luftre, and tranfparency, various: when tranfparent, it caufes double refraction; fpecific gravity from 2.315 to 2.78; colour, when pure, white; effervefces violently with muriatic acid, and diffolves in it entirely, or nearly fo, forming a colourlefs folution.

Its different varieties may be arranged under,

1. *Creta alba.* Soft carbonate of lime. Chalk.
2. *Marmor album.* Indurated carbonate of lime. Marble.

They contain about 45 parts of carbonic acid, and 55 of lime.

In medicine it is given to correct acidity in the primæ viæ, efpecially when accompanied with loofenefs. Powdered chalk has been externally applied with fuccefs to fcalds and burns.

Off. prep.—Aqua aëris fixi, *Dub.* Aqua fuper-carb. pot. *Ed. Dub.* Carbonas ammon. *Ed. Lond. Dub.* Aqua fuper-carb. ammon. *Ed. Lond. Dub.* Carb. calcis, ppt. *Ed. Lond. Dub.* Solutio muriatis calcis, *Ed.* Potio carbonatis calcis, *Ed. Lond. Dub.* Trochifci carb. calc. *Ed. Lond.* Pulv. carb. calc. comp. *Ed. Lond.* Pulv. cret. comp. cum opio, *Lond.* Pulv. chelar. cancr. comp. *Lond.*

CARBONAS POTASSÆ IMPURUS. *Ed. Cineres clavellati. Lond. Dub. Alkali fixum vegetabile. Lixiva.*

Pearl afhes. Potafhes. Impure carbonate of potafs. Fixed vegetable alkali.

THE potafhes of commerce are fent to us from the fhores of the Baltic and from America. They are prepared by lixiviating the afhes of vegetables in barrels, firft with cold and then with hot water, filtering the ley, and evaporating it to drynefs in an iron pot. In this ftate they ftill contain fome vegetable matter, not perfectly incinerated, which gives them a brown or black colour. To deftroy this, and render their colour purer, they are again burnt in a reverberatory furnace. They now get the name of pearl afhes; but even yet they are very impure, and often contain the fulphates of potafs and of lime, and the muriate of potafs. They are alfo frequently adulterated with vegetable afhes, fand, and fulphate of potafs. The afhes are detected by their difficult and imperfect folution; the fand, by the precipitation of filica in a gelatinous form by the addition of an acid, and the fulphate of potafs by its cryftallization. All vegetables which grow at a diftance from the fea afford potafhes by incineration: herbs give the largeft proportion, then the leaves of trees, then fhrubs, and woods

the leaſt. It formerly had the name of Fixed Vegetable Alkali; but it is alſo found, though much more ſparingly, both in the animal and mineral kingdoms.

Vauquelin has given a table of the quantity of pure potaſs, and of heterogenous matters, contained in 1152 parts of the different potaſhes of commerce.

	Potaſs.	Sulphate of potaſs.	Muriate of potaſs.	Inſoluble reſiduum.	Carb. acid and water.
Ruſſian potaſhes,	772	65	5	56	254
American do.	857	145	20	2	119
Pearl aſhes,	754	80	4	6	308
Potaſhes of Treves,	720	165	44	24	199
Dantzic aſhes,	603	152	14	79	304
Potaſhes of Voſges,	444	148	510	34	304

The potaſs was eſtimated by the quantity of diluted nitrous acid ſaturated by it; the ſulphate of potaſs by the precipitate formed with nitrate of baryta; and the muriate of potaſs by that formed with nitrate of ſilver.

All theſe different potaſhes, except the laſt, may be purified ſufficiently for pharmaceutical purpoſes, by lixiviating them with a ſmall proportion of cold water, and evaporating the ley to dryneſs in an iron pot.

Medical uſe.—Carbonate of potaſs is uſed in form of lotion, in rachitic and ſome cutaneous diſeaſes, and as a ſtimulant to the inactive ſtate of the veſſels in certain ulcers. It is uſed internally as a diaphoretic or diuretic, and of late in calculous complaints; but its continued uſe ſeldom fails to injure the conſtitution, or the inteſtinal canal.

Off. prep.—Carbonas potaſſæ, *Ed. Lond. Dub.* Alcohol ammoniat. *Lond. Dub.* Spirit ammon. fœtid. *Lond.*

CARBONAS SODÆ IMPURUS. *Ed.* *Barilla. Lond. Dub.*
Impure carbonate of ſoda. Barilla. Fixed mineral alkali.

Soda is a very common mineral production. It is the baſis of ſea ſalt; and combined with carbonic acid, it is found on the ſurface of the earth in Egypt, Syria, Barbary, Hungary, &c. and is obtained by the incineration of marine vegetables, eſpecially the ſalſola ſoda and kali, the ſalicornia herbacea, &c. The Spaniards even cultivate theſe in ſalt marſhes for the ſake of the ſoda. After being cut down, they are dried like hay. A deep pit is then prepared, and a bundle or two of the dried vegetables ſet on fire are thrown into it. When well kindled, other bundles are thrown in until the pit is filled. When the incineration is completed, the ſoda is found in the bottom, caked into a ſolid maſs,

which is worked like a ſtony ſubſtance. When good, it is firm, hard, heavy, dry, ſonorous, ſpongy, and internally of a blue colour mixed with white ſpots, does not deliqueſce, emits no unpleaſant ſmell on ſolution, and does not leave a large proportion of inſoluble matter. Incinerated ſoda is mixed with potaſh, muriate of ſoda, and other ſaline matters; mineral ſoda with clay and other earthy ſubſtances. The Egyptian ſoda was reckoned the beſt; then the Spaniſh (barilla); afterwards the Carthaginian; and that prepared from different ſpecies of fuci (kelp), is the worſt.

But all theſe carbonated ſodas are inferior in purity to thoſe now manufactured in Britain, by decompoſing the ſulphate of ſoda.

That commonly uſed, is obtained by the bleachers as a reſiduum in their method of preparing oxygenized muriatic acid, by decompoſing muriate of ſoda with ſulphuric acid and the black oxide of mangaueſe.

The ſulphate of ſoda is decompoſed,

1. By carbonate of potaſs. Mr. Accum has deſcribed the manipulations of this mode. A boiling concentrated ſolution of about 560 pounds of American potaſhes is ladled into a boiling ſolution of 500 pounds of ſulphate of ſoda, agitated together, and the whole quickly heated to ebullition. It is then drawn off into leaden ciſterns, lined with thick ſheet-lead, and allowed to cool in a temperature which ſhould not exceed 55°.

   The fluid is then drawn off, and the maſs of ſalt waſhed with cold water, to free it from impurities, and again put into the boiler with clean water. This ſecond ſolution is alſo evaporated at a low heat, as long as any pellicles of ſulphate of potaſs form on its ſurface, and fall to the bottom of the fluid. The fire is then withdrawn, and the fluid ladled out into the ciſtern to cryſtallize. Unleſs the fluid be allowed to cool pretty low before it is removed to cryſtallize, the ſalt obtained will contain ſulphate of potaſs.
2. By acetate of lime. The acetous acid for this purpoſe is obtained by diſtillation from wood, during its converſion into charcoal.
3. By litharge or ſub-acetate of lead. Very pure carbonate of ſoda is prepared by this proceſs in the vicinity of Edinburgh.
4. By decompoſing the ſulphuric acid by charcoal. About 500 cwt. of ſulphate of ſoda, and 100 cwt. of charcoal are ground together, and the mixture expoſed in a rever-

berator furnace until it becomes pafty. It is then tranf-ferred into large cafks, and lixiviated. The ley is afterwards evaporated and cryftallized. By this, or a fimilar procefs, very pure carbonate of foda is manufactured in the weft of Scotland.

On the continent, muriate of foda is fometimes decompofed by potafs, and fometimes by lime.

Carbonate of foda is an article of the greateft importance in many manufactures.

Medical ufe.—In medicine, it poffeffes fimilar virtues with the carbonate of potafs; and from its cryftallizability and efflorefcence when expofed to the air, it is preferable to it, becaufe its dofe may be more accurately afcertained, and it may be given either in the form of powder, or made up into pills.

Off. prep.—Carbonas fodæ, *Ed. Lond. Dub.*

CARDAMINE PRATENSIS. *Ed.* *Cardamine. Lond.*

Willd. g. 1257. *fp.* 19. *Tetradynamia Siliquofa.*—Nat. ord. *Siliquofæ.*

Ladies fmock.

Off.—Petalum, folium. The petals and leaves.

LADIES SMOCK is a perennial plant, which grows in meadow-grounds, fends forth purplifh flowers in the fpring; and in its fenfible qualities refembles the *fifymbrium nafturtium.*

Medical ufe.—Long ago it was employed as a diuretic; and it has been again introduced in nervous difeafes, as epilepfy, hyfteria, chorea, afthma, &c. A drachm or two of the powder is given twice or thrice a-day. It has little fenfible operation, except that it fometimes acts as a diaphoretic.

CARUM CARUI. *Ed.* *Carui. Dub.* *Caruon. Lond.*

Willd. g. 561. *fp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Caraway.

Off.—Semen. The feeds.

CARAWAY is a biennial umbelliferous plant, cultivated with us in gardens, both for culinary and medicinal ufe. The feeds have an aromatic fmell, and warm pungent tafte.

Med. ufe.—They are employed as a ftomachic and carminative in flatulent colics and the like.

Off. prep.—Ol. volat. *Lond. Dub.* Spiritus, *Ed. Lond. Dub.* Decoct. anth. nob. *Ed.* Tinct. cardamomi comp. *Lond. Dub.* Tinct. fen. *Lond. Dub.* Confect. opiat. *Lond.* Emplaft. cumini.

CARYOPHILLUS AROMATICUS. See EUGENIA.

CASSIA.
Willd. g. 813. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Sp. 18. CASSIA FISTULA. *Ed.* *Syn. Caſſia fiſtularis. Lond. Dub.*
Caſſia tree.
Off.—Fructus, pulpa. The fruit and pulp.

THIS tree is indigenous in India and Egypt, and is cultivated in Jamaica. It riſes to about thirty feet high, and has long flower ſpikes, with yellow papilionaceous bloſſoms.

Its fruit is a cylindrical pod, ſcarcely an inch in diameter, a foot or more in length: the outſide is a hard brown bark, the inſide is divided by thin tranſverſe woody plates, covered with a ſoft black pulp, of a ſweetiſh taſte, with ſome degree of acrimony. There are two ſorts of this drug in the ſhops; one brought from the Eaſt Indies, the other from the Weſt, (Caſſia Javanica?) The canes or pods of the latter are generally large, rough, thick-rhinded, and the pulp nauſeous; thoſe of the former are leſs, ſmoother, the pulp blacker, and of a ſweeter taſte; this ſort is preferred to the other. Such pods ſhould be choſen as are weighty, new, and do not make a rattling noiſe, from the ſeeds being looſe within them, when ſhaken. The pulp ſhould be of a bright, ſhining, black colour, and have a ſweet taſte, neither harſh, which happens from the fruit being gathered before it has grown fully ripe, nor ſouriſh, which it is apt to become upon keeping, nor at all mouldy, which, from its being kept in damp cellars, or moiſtened, in order to increaſe its weight, it is very ſubject to be. Greateſt part of the pulp diſſolves both in water and in alcohol; and may be extracted from the pod by either. The ſhops employ water, boiling the bruiſed pod therein, and afterwards evaporating the ſolution to a due conſiſtence.

Med. uſe.—The pulp of caſſia, from its ſaccharine and extractive conſtituents, is a gentle laxative medicine, and is frequently given, in a doſe of ſome drachms, in coſtive habits. Some direct a doſe of two ounces, or more, as a cathartic, in inflammatory caſes, where the more acrid purgatives are improper; but in theſe large quantities it generally excites nauſea, produces flatulence, and ſometimes gripings of the bowels, eſpecially if the caſſia be not of a very good kind: theſe effects may be prevented by the addition of aromatics, and by exhibiting it in a liquid form.

Off. prep.—Pulpa expreſſa, *Ed. Lond.* Elect. *Ed. Lond. Dub.* Elect. ſennæ, *Ed. Lond.*

Sp. 24. CASSIA SENNA. *Ed.* *Syn. Senna. Lond. Dub.*
Senna.
Off.—Folium. The leaves.

This species of cassia is annual, although in its mode of growth it resembles a shrub, and sends out hollow woody stems, to the height of four feet. It grows principally in Upper Egypt, from whence the leaves are brought, dried, and picked from the stalks, to Alexandria in Egypt, and thence imported into Europe. They are of an oblong figure, sharp-pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a subacrid, bitterish, nauseous taste. Some inferior sorts are brought from other places: these may easily be distinguished by their being either narrower, longer, and sharper pointed, from Mocha; or larger, broader, and round-pointed, with small prominent veins, from Italy; or large and obtuse, of a fresh green colour, without any yellow cast, from Tripoli.

It has been customary to reject the pedicles of the leaves of senna, as causing gripes and pains in the bowels; but this is a mere prejudice, for both leaves and pedicles act in the very same way. Neumann from 480 parts of senna got 143 alcoholic extract, and afterwards 140 watery; and inversely, 245 watery, and only 28 alcoholic, so that it seems to consist chiefly of mucilage and extractive.

Medical use.—Senna is a very useful cathartic, operating mildly, and yet effectually; and, if judiciously dosed and managed, rarely occasioning the ill consequences which too frequently follow the exhibition of the stronger purges. The only inconveniencies complained of in this drug are, its being apt to gripe, and its nauseous flavour.

These are best obviated by adding to the senna some aromatic substance, as ginger, cinnamon, &c. and by facilitating its operation by drinking plentifully of any mild diluent.

Senna may be given in substance to the extent of about a drachm, but it is rather too bulky, and it is therefore better to divide it into two doses, and to take one half at night, and the other in the morning. It is more conveniently given in the form of infusion, which is generally made by pouring about six ounces of boiling water upon from two to six drachms of senna leaves in a tea-pot, and letting it stand about an hour. Senna ought never to be ordered in decoction, Gren says, because it becomes perfectly inert, from the total dissipation of the nauseous and volatile principle on which its purgative effects depend. The tincture, on account of the menstruum, cannot be given in doses large enough to purge.

Off. prep.—Infusum sennæ, *Lond. Dub.* Inf. sennæ tart. *Lond.* Inf. tamarindi cum senna, *Ed.* Syrupus mannæ, *Dub.* Tinct. senn. comp. *Ed. Lond. Dub.* Elect. *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Lond.*

CASTOR FIBER. *Ed.*

Mammalia Rodentia, Cuvier.

Off.—Materia in folliculis prope anum collecta, *Caſtoreum* dicta, *Ed.* Caſtoreum Roſſicum, *Dub.* Materia in folliculo prope anum ſito collecta, *Lond.*

The Beaver. Caſtor. The ſubſtance collected in the follicles near the anus.

The beaver is ſtrongly characterized by its flat, horizontal, ſcaly tail. It is an amphibious animal, and is found in the northern parts of Europe, Aſia, and America, on the banks of lakes and rivers. In inhabited countries it is a ſolitary ſlothful animal, but in deſert regions it lives in ſociety; the remarkable manners of which, and the immenſe works effected by the united labours of all the individuals of their republic, have rendered the natural hiſtory of this animal familiar to every one. In both ſexes, between the anus and pudendum, there are four follicles, of an oblong ſhape, ſmaller above, and larger below, formed of a tough membrane, almoſt reſembling leather. The two largeſt and undermoſt of theſe, which are alſo connected, and lie parallel and cloſe to each other, contain an oily fluid ſecretion, which is the ſubſtance known by the name of Caſtor. It is preſerved by cutting out the entire bags, and drying them in the ſmoke.

The beſt caſtor comes from Ruſſia, Pruſſia, and Poland. The cods ſhould be dry, gibbous, roundiſh, heavy, ſolid, and filled with a ſolid ſubſtance contained in membranous cells, ſomewhat tough, but brittle, of a dark-brown colour, of a peculiar, diſagreeable, narcotic ſmell, and a nauſeous, bitter, acrid taſte. The Canadian caſtor is of an inferior quality; the cods are ſmaller, thin, oblong, and much corrugated, and the caſtor itſelf has much leſs ſmell and taſte: what is very old, quite black, and almoſt deſtitute of ſmell and taſte, is unfit for uſe, as well as the counterfeited caſtor, which is a mixture of various gummy reſins and other ſubſtances, with a little real caſtor, artificially interſperſed with membranes, and ſtuffed into the ſcrotum of a goat. This impoſition is eaſily detected, by the weaker degree of its ſmell and taſte, by chemical analyſis, and even by mere external examination; for to the real bags, the two ſmaller and upper follicles, filled with a fatty matter, are always attached.

Neumann got from 480 parts of caſtor 140 alcoholic extract, and afterwards 80 watery; inverſely, 140 watery, and 20 alcoholic. The firſt alcoholic extract retained the whole flavour of the caſtor, as none of it roſe in diſtillation with the alcohol. The diſtilled water, on the contrary, contained the whole flavour, and the watery extract was merely bitter. Cartheuſer obtained from it a volatile oil by diſtillation.

Medical use.—Castor is an excellent antispasmodic. It is very little heating, and acts particularly on the uterine system.

It is given with advantage,

1. In typhoid fevers.
2. In spasmodic diseases, especially in hysteria and epilepsy, and in cases of difficult parturition, from a spasmodic contraction of the mouth of the uterus after the membranes have burst.
3. In amenorrhœa.

It is exhibited most advantageously in the form of powder, in doses of from 10 to 20 grains, and in clysters, to a drachm. Diluted alcohol extracts its virtues; therefore it may be also given in the form of tincture. But its exhibition in the form of extract or decoction is improper.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CENTAUREA BENEDICTA. *Ed.* *Carduus Benedictus. Lond. Dub.*

Willd. g. 1548. *sp.* 89. *Syngenesia Polygamia frustranea.*—Nat. ord. *Compositæ capitatæ.*

Blessed Thistle.

Off.—Herba, folium. The leaves or plant.

This is an annual plant, indigenous in the Grecian islands, and cultivated in gardens. It flowers in June and July, and perfects its seeds in the autumn. The herb should be gathered when in flower, quickly dried, and kept in a very dry airy place, to prevent its rotting, or growing mouldy, which it is very apt to do. The leaves have a penetrating bitter taste, not very strong or very durable, accompanied with an ungrateful flavour, from which they are in a great measure freed by keeping. Water extracts, in a little time, even without heat, the lighter and more grateful parts of this plant; if the digestion be continued for some hours, the disagreeable parts are taken up. A strong decoction is very nauseous and offensive to the stomach. Rectified spirit gains a very pleasant bitter taste, which remains uninjured in the extract.

Neumann got from 1920 parts 270 alcoholic, and afterwards 390 watery extract; and inversely, 600 watery, and 60 alcoholic.

Med. use.—The virtues of this plant seem to be little known in the present practice. The nauseous decoction is sometimes used to provoke vomiting, and a strong infusion to promote the operation of other emetics. But this elegant bitter, when freed from the offensive parts of the herb, may be advantageously applied to other purposes. Excellent effects have been frequently experienced from

a flight infufion of carduus, in lofs of appetite, where the ftomach was injured by irregularities. A ftronger infufion, made in cold or warm water, if drunk freely, and the patient kept warm, occafions a plentiful fweat, and promotes the fecretions in general.

The extract prepared, by evaporating the expreffed juice, with the addition of a little alcohol, to prevent it from becoming mouldy, has been ftrongly recommended in the catarrh of children.

The feeds of this plant are alfo confiderably bitter, and have been fometimes ufed with the fame intention as the leaves.

CEPHAELIS IPECACUANHA. *Ipecacuanha. Lond. Ed. Dub.*

Willd. g. 357, *fpecies nova. Pentandria Monogynia.*—Nat. ord. *Aggregatæ.*

Ipecacuan.

Off.—Radix. The root.

IPECACUAN, in the language of South America, means vomiting root, and is applied to various vegetables which poffefs that property in any remarkable degree; hence the confufion and contradictions which have long prevailed concerning the plant which furnifhes our officinal Ipecacuan: but this confufion is increafed by feveral varieties of Ipecacuan being found in the fhops.

1ft, The afh-coloured, or Peruvian ipecacuan, is a fmall wrinkled root, bent and contorted into a great variety of figures, brought over in fhort pieces, full of wrinkles and deep circular fiffures, quite down to a fmall white woody fibre that runs in the middle of each piece: the cortical part is compact, brittle, looks fmooth and refinous upon breaking: it has very little fmell; the tafte is bitterifh and fubacrid, covering the tongue as it were with a kind of mucilage. This, according to Mutis, is obtained from the Pfycotria emetica, and is that commonly ufed.

2d, The brown ipecacuan is fmall, and fomewhat more wrinkled than the foregoing; its bark is of a brown or blackifh colour without, and white within; this is brought from Brazil, and is the root of a cephaëlis, which is perennial, and grows in moift fhady fituations. A complete monography of it, and an excellent plate, were publifhed, in the fixth volume of the Tranfactions of the Linnæan Society, by Profeffor Brotero, who calls it the Callicocca Ipecacuanha; but the genus Callicocca has been united by Willdenow with that of Cephaëlis, to which we have therefore referred it. The plate of Brotero correfponds with that publifhed in Woodville's Medical Botany, vol. iii, from a plant fent in fpirits from Brazil by Governor Philips to Sir Jofeph Banks, but which unfortunately was not

in flower, and alſo with the rude draught of Piſo, who firſt examined it. It has been ſometimes obſerved, even in a ſmall doſe, to produce violent effects.

3d, The white ſort is woody, has no wrinkles, and no perceptible bitterneſs in taſte. It is probably the root of a viola. Though taken in a large doſe, it has ſcarcely any effect at all.

Beſides theſe, the name of Ipecacuan is given to various ſpecies of Cynanchum, Aſclepias, Euphorbia, Dorſtenia, and Ruellia. With regard to their comparative ſtrengths, Decandolle ſays, that vomiting is produced by 22 grains of the Cynanchum Ipecacuanha, 24 of the Pſycotria emetica, 60 to 72 of the Viola calceolaria, and one to three drachms of the Viola Ipecacuanha.

Ipecacuan was firſt brought into Europe about the middle of laſt century, and an account of it publiſhed about the ſame time by Piſo; but it did not come into general uſe till about the year 1686, when Helvetius, under the patronage of Lewis XIV, introduced it into practice.

Neumann got from 7680 parts 1440 alcoholic, and afterwards 1880 watery extract; and inverſely, 2400 watery, and 600 alcoholic. I find that the tincture of ipecacuan does not redden infuſion of lithmus, or precipitate a ſolution of gelatin; that it is precipitated by water, by red ſulphate of iron, and readily acquires a green colour from exceſs of the chalybeate; and by infuſion of gall nuts. According to Dr. Irvine, the watery ſolution is more emetic than the alcoholic, the decoction than the diſtilled water, and the cortical than the ligneous part. Others have found, that the reſinous part is more apt to act upon the inteſtinal canal, and to operate by ſtool. By long continued boiling, it becomes almoſt inert; and the emetic property of ipecacuan is moſt effectually counteracted by means of the acetic acid, inſomuch that thirty grains of the powder taken in two ounces of vinegar, produced only ſome looſe ſtools.

From theſe experiments it evidently appears, that ipecacuan contains cinchonin and a reſin, and that its emetic property does not depend upon the latter, although we can ſcarcely attribute it to the former, as in other ſubſtances it does not manifeſt any emetic property. It is therefore probably owing to ſome other principle ſoluble in water and alcohol.

Med. uſe.—The primary effect of ipecacuan is that of ſtimulating the ſtomach. If the doſe be ſufficiently large, it excites vomiting, by inverting the periſtaltic motion of the ſtomach and duodenum; in a ſmaller doſe it only produces nauſea, and operates by ſtool, and in ſtill ſmaller doſes it gently ſtimulates the ſtomach, increaſes the appetite, and facilitates digeſtion. Its ſecondary effects depend on the ſympathy of other parts with

the ſtomach; and in this way only can we explain its action as an antiſpaſmodic, diaphoretic, expectorant, and in checking hæmorrhagies. Its beneficial effects, in ſome caſes, alſo ſeem to be owing to the general concuſſion given to the whole ſyſtem during the action of vomiting.

Ipecacuan, properly adminiſtered, often proves ſerviceable,

1. In intermittent fevers. It has frequently ſucceeded in ſtopping theſe, when given about an hour before an acceſſion was expected, and alſo when given ſo as to produce vomiting at the time of an acceſſion, or at the end of the cold ſtage.
2. In continued fevers. We have never ſeen more decidedly beneficial effects from the uſe of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetic, ſucceeded by a diaphoretic regimen, when adminiſtered ſufficiently early in this diſeaſe, very frequently cuts it ſhort at once; and when it fails in this deſirable object, it always has a beneficial influence on the progreſs of the fever.
3. In inflammatory diſeaſes, rheumatiſm, bubo, ſwelled teſticle.
4. In exanthematous diſeaſes, when the eruption is diſpoſed to recede.
5. In hæmorrhagies, when given in nauſeating doſes.
6. In profluvia, eſpecially in dyſentery, ſo much ſo, that it was formerly eſteemed a ſpecific againſt that diſeaſe. But Cullen attributes its good effects, in this inſtance, to its producing a ſteady determination of the periſtaltic motion of the inteſtines downwards, when given in repeated ſmall doſes.
7. In many ſpaſmodic diſeaſes; in epilepſy, aſthma, dyſpnœa, pertuſſis, chronic diarrhœa, hyſteria, melancholy, mania.
8. In cachectic diſeaſes, as in ſome kinds of dropſy.
9. In impetiginous diſeaſes; in jaundice.
10. In local diſeaſes; in amauroſis, and ſeveral of the dyſorexiæ.
11. Laſtly, in every inſtance when we wiſh to evacuate the ſtomach, as when it is overloaded with food, or when poiſon, eſpecially opium, has been ſwallowed.

The uſe of ipecacuan, as an emetic, is contraindicated,

1. Where there is a diſpoſition to hæmorrhagy.

2. Where there is an increafed flow of blood towards the head.
3. In very irritable fubjects.
4. In pregnant women, and perfons afflicted with hernia.

Ipecacuan is exhibited,

1. In fubftance; in powder. Full vomiting will generally be produced in an adult by a fcruple or half a drachm; and though lefs might anfwer the purpofe, fortunately an over dofe is fcarcely attended with any inconvenience, as the whole of it is vomited with the contents of the ftomach as foon as it operates. The vomiting is promoted and facilitated by drinking copioufly of warm watery fluids. On the contrary, when vomiting is not intended, liquids muft be rather drunk fparingly, and the dofe muft be diminifhed to a grain or lefs. In fuch fmall dofes it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.
2. In infufion. One drachm may be infufed in four ounces of water, and taken in repeated dofes till it operate.
3. Infufed in wine.

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the beft antidotes for its poifon, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increafing the cuticular difcharge.

Off. prep.—Vinum Ip. *Ed. Lond. Dub.* Pulv. Ip. et opii, *Ed. Lond. Dub.*

CERA.

A. CERA FLAVA. *Ed. Lond. Dub.*

Yellow wax.

FOR this ufeful fubftance we are indebted to the common honey bee (*apis mellifica*), an infect belonging to the clafs of *Hymenoptera mellita* of Cuvier. It is, however, a vegetable production, and is collected by the bees from the furface of leaves, and the antheræ of flowers. They employ it to form the combs in which the honey and larvæ are depofited.

It is found in the fhops in round cakes, which are formed by melting the combs, after all the honey has been expreffed from them, in hot water. The wax fwims above, and the impurities either fink to the bottom, or are diffolved in the water. When

recent, it is tenacious, but brittle, of a yellow colour, and ſweet honey-like ſmell; dry, not greaſy, to the feel; inſoluble in water, alcohol, and ether; ſoluble in the fat oils and alkalies; fuſible and inflammable. In ſelecting it, we ſhould obſerve that the cakes be brittle, have a pleaſant yellow colour, an agreeable ſmell, no taſte, do not adhere to the teeth when chewed, and burn entirely away. When adulterated with reſin, the fraud is detected by its taſte, and the action of alcohol, which diſſolves the reſin. When mixed with peaſe meal or earthy ſubſtances, it is more brittle, of a paler colour, and may be ſeparated from them by liquefaction and ſtraining. When combined with tallow, it becomes leſs brittle, but at the ſame time ſofter, and has an unpleaſant ſmell.

Pharm. prep.—Oxidum antim. vitrif. cum cera, *Ed.* Ungt. reſ. flav. *Lond. Dub. Ed.* Cerat. res. flav. *Lond. Dub.* Emplaſt. Ceræ, *Lond. Dub. Ed.* Ungt. picis, *Ed.* U. picis, Burgund. *Lond. Dub.* Emplaſt. cumini, *Lond.* Ungt. inf. mel. veſic, *Ed.* Empt. mel. veſ. *Ed.* Emp. mel. ves. comp. *Ed.* Emp. aſſæ fœt. *Ed.* Empl. gummos, *Ed.* Cer. ſaponis, *Lond. Dub.* Cer. lith. acet. comp. *Lond. Dub.* Cer. lap. calam. *Lond. Dub.* Empl. oxidi ferri rubri, *Ed.*

B. Cera Alba. *Lond. Dub. Ed.*

White wax.

The yellow colour of bees wax, and its peculiar ſmell, may be deſtroyed by the combined action of water, air, and the ſun's rays. In the proceſs for bleaching wax, we, therefore, extend its ſurface as much as poſſible, by melting it and forming it into thin plates, which are fully expoſed to the ſun's rays, upon linen ſtretched in frames, and repeatedly moiſtened, until they acquire the whiteneſs deſired. It is then uſually melted into thin diſcs. White wax is more brittle, leſs fuſible, and heavier than yellow wax. It is ſometimes mixed with white oxide of lead, or with tallow. For medical uſe, it has no advantage over yellow wax.

Medical uſe.—When taken internally, wax agrees in its effects with the fat oils, and though leſs frequently preſcribed in this way, it is preferable, being leſs apt to become rancid. Poerner recommends it as an excellent remedy in diſeaſes of the inteſtines, attended with pain, excoriation, and obſtinate diarrhœa. He gave a ſcruple, or half a drachm of wax, three or four times a-day, in the form of an emulſion, by melting it firſt with ſome fixed oil, and then mixing it with a decoction of groats by trituration with the yolk of an egg. But by far its principal uſe is for the formation of cerates, ointments, plaſters, &c.

Off. prep.—Linam. ſimp. *Ed.* Ung. ſimp. *Ed.* Ung. ſperm. ceti, *Lond. Dub.* Ung. ceræ, *Lond. Dub.* Cerat. ſimp. *Ed.* Cerat. ſper. ceti. *Lond. Dub.* Ung. ceruſſæ acet. *Lond. Dub.*

CERVUS ELAPHUS. *Syn. Cervus. Lond. Mammalia ruminantia.*

The ſtag or hart

Off.—Cornu, Cornu cervinum. The horns.

THE male has two round ſolid horns on his forehead, with ſeveral conical branches, the number of which aſcertain the age of the animal to which they belong. Theſe horns fall off and are renewed every year. When firſt produced, they are ſoft, full of blood veſſels, and covered with a velvety ſkin, but they ſoon loſe their covering, and become hard, compact, and bony.

In their nature they do not ſeem to differ from bone except in containing a larger proportion of cartilage. They afford a very conſiderable quantity of gelatine by decoction with water, and hartſhorn ſhavings are ſtill employed in domeſtic economy for furniſhing a nutritious and demulcent jelly. By the action of fire, their products are the ſame with thoſe of animal ſubſtances in general, and they were formerly ſo much uſed for the preparation of ammonia, that it was commonly called Salt or Spirit of Hartſhorn. By burning they are totally converted into phoſphate of lime.

Off. prep.—Liquor volat. ſal, et oleum, cornu cervi, *Lond. Dub.* Cornu cervi uſt. *Lond. Dub.* Oxidum antimon. cum phoſphat. calcis, *Ed. Lond. Dub.*

CHIRONIA CENTAURIUM. *Ed. Syn. Centaureum minus. Dub. Lond. Gentiana centaureum.*

Willd. g. 394, *ſp.* 9. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ.*

Smaller Centaury.

Off.—Summitas florens, Cacumen. The flowery heads.

THIS plant is annual, and grows wild in many parts of England on barren paſtures. It flowers between June and Auguſt. The corolla is ſaid to have no taſte; and therefore the herb, which is intenſely bitter, ſhould be preferred to the flowering tops which derive their virtues only from the ſtalks connected with them. It agrees in every reſpect with other pure bitters.

Neumann got from 480 parts 210 alcoholic, and 140 watery extract, and inverſely 320 watery, and 40 alcoholic.

CINCHONA.

Willd. g. 346. *Pentandria Monogynia.*—Nat. ord. *Contortæ.*

Sp. 1. CINCHONA OFFICINALIS. *Ed. C. cordifolia,* Mutis. *Cinchona. Lond. Cortex Peruvianus. Dub.*

Official Cinchona.

Off.—Cortex. The bark, commonly called Peruvian bark, of which the Edinburgh college enumerates three varieties,

a. The common.
b. The yellow,
c. The red.

By the recent obſervations of the Spaniſh botaniſts, it is now, however, aſcertained, that theſe are not only the barks of diſtinct ſpecies of cinchona, but that probably each of them is indiſcriminately taken from ſeveral different ſpecies. Ruiz and Pavon have deſcribed fifteen ſpecies natives of Peru and Chili, and if to them we add thoſe of Tafalla and Vahl, twenty-five diſtinct ſpecies have been deſcribed, of which ſeven have been found in North America in the neighbourhood of Santa Fé, by Mutis. Cinchona, conſidered as a genus, is a mountainous tree, and is never found in the plains. It grows to a great height, and formerly its trunk was often thicker than a man's body. But ſince its bark has come into ſuch general uſe, few trees are to be ſeen thicker than the arm. Indeed, there is reaſon to fear, that it will become ſtill more ſcarce, as no attention is paid to its cultivation, and the trees always die after being ſtripped of their bark. This operation is performed in the dry ſeaſon, from September to November. The bark is then carefully dried in the ſun, and packed in ſkins, which contain from 100 to 150 pounds, and are called by the Spaniards zeronne. In theſe, coarſe and fine pieces of the ſame kind of bark are promiſcuouſly mixed, but they are afterwards ſorted.

1. Common pale bark. This is ſaid to be the bark of the cinchona cordifolia of Mutis, under which he includes the hirſuta, ovata, purpurea, and micrantha of the Flora Peruviana, the officinalis of Linnæus, and the pubeſcens of Vahl.

In commerce we find ſeveral varieties of the common pale bark, the moſt remarkable of which come from Loxa, the quilled bark, and from Guanaco, the flat bark.

The bark which comes from Loxa conſiſts of thin, ſingly or doubly rolled, pieces, four or five inches long, and ſcarcely a line in thickneſs; externally rough, of a greyiſh brown colour, and generally covered with a kind of lichen; internally of a cinnamon colour. Its fracture ſhould not be fibrous or powdery, but even and ſhining. It has a peculiar aromatic ſmell, and a pleaſant, bitter, aſtringent taſte,

The bark which comes from Guanaco conſiſts of much thicker, coarſer, and flatter, pieces; externally of a dark brown or almoſt black colour, but internally it has the ſame cinnamon colour; and in its reſinous fracture, ſmell, and taſte, it exactly reſembles the former. When genuine, both varieties are excellent remedies, although the former be generally preferred on the continent, and the latter in Britain.

2. Yellow Peruvian bark. This variety of bark has only

been introduced into European practice since 1790, when it was sent from Santa Fè by Mutis. It is the bark of his chinchona lacifolia, under which he includes the nitida, glabra, or lanceolata, fusca, or rosea, angustifolia, or tunitæ, the officinalis of Condamine and Vahl. It consists of pieces about six inches in length, thicker, and less rolled up than the common bark. Its internal surface is of a deeper red. It sometimes wants the epidermis, which is often as thick as the bark itself. It is lighter and more friable than the former variety; its fracture is fibrous; and when reduced to powder, its colour is paler. Its taste is much more bitter, astringent, and stronger, but its smell is weaker. Its decoction when hot is redder, but when cold, paler. Its solutions strike a deeper colour with sulphate of iron. It contains more of the active constituents than either of the others, but less gum than the common, and less resin than the red. It is much more powerful than the preceding species, and, according to Mutis, is the only one which is directly febrifuge. The epidermis should always be removed before it be powdered.

3. Red Peruvian bark is obtained from the cinchona magnifolia of Ruiz and Pavon, the oblongifolia of Mutis. It occurs generally in much larger, thicker, flatter pieces, but sometimes also in the form of quills. It is heavy, firm, sound, and dry; friable between the teeth; does not separate into fibres; and breaks, not shivery, but short, close, and smooth. It has three layers: the outer is thin, rugged, of a reddish brown colour, but frequently covered with mossy matter; the middle is thicker, more compact, darker coloured, very resinous, brittle, and yields first to the pestle: the inmost is more woody, fibrous, and of a brighter red. Its powder is reddish, like that of Armenian bole.

Its astringency and bitterness are more intense, and it contains more resin than the pale bark. It is not, however, allowed by Mutis to be like the yellow bark, directly febrifuge. It is said to be more frequently adulterated.

The great price of Cinchona bark has sometimes tempted dishonest men to adulterate it with other similar and less powerful barks, and, what is still more blameable, with genuine bark, from which the active constituents have been entirely extracted by decoction with water.

In selecting Cinchona bark, we must therefore see, that, besides the characteristics already noticed, it be dense, heavy, and dry, not musty or spoiled by moisture, and that a decoction made of it have a reddish colour when warm, but when cold become paler, and deposite a brownish red sediment. Those pieces whose taste is simply intensely bitter or very astringent, or nauseous, or merely mucilaginous, whose surface is smooth or polished, of a dark

colour, or pale yellow, or red, which are tough or ſpongy, whoſe fracture is fibrous, woody, or powdery, and their internal colour white or grey, are to be rejected.

There are few vegetable ſubſtances which have been ſo much ſubjected to analyſis as Cinchona bark, and yet our knowledge of it is extremely imperfect. Neumann got from 7680 parts 640 alcoholic, and afterwards 300 watery extract, and inverſely 336 watery, and 600 alcoholic. Lewis obſerved that the decoction became turbid on cooling, but aſcribed this to the ſeparation of reſin, which he ſuppoſed had been melted out by the heat. He alſo aſcertained that the bitterneſs remained diſſolved while the aſtringency reſided chiefly in this precipitate, and that the precipitate was ſoluble in alcohol. In his experiments chalybeate ſolutions ſtruck a deep green with the decoction of bark. Dr. Irving, however, remarked, that recent preparations of bark ſtruck a black colour, while thoſe which had been kept ſome time became green. Seguin's diſcovery at laſt enabled chemiſts to aſcertain the aſtringency of different ſubſtances with more preciſion; and Dr. Maton and Mr. Davy found that Cinchona bark contained very little tannin. Dr. Maton alſo diſcovered, that ſolutions of cinchona were precipitated by tannin, and Seguin hence concluded that it contained gelatine. This laſt opinion, however, I proved to be erroneous, and to depend upon a principle, to which, as in its properties it did not coincide with any other which had hitherto been deſcribed, I gave the name of Cinchonin. Tincture of cinchona is precipitated by water, the precipitate is eaſily ſeparated by filtration, the filtered ſolution is copiouſly precipitated by infuſion of gall nuts, and ſlightly by ſolution of gelatine. The latter precipitate in every reſpect is the ſame with that produced in other aſtringents by gelatine, and therefore indicates the preſence of tannin; the former is ſoluble in alcohol, which is an additional proof that it is not to be aſcribed either to the preſence of gelatine or of ſtarch. With a very ſmall proportion of red ſulphate of iron, it acquires a purpliſh colour, with a ſomewhat larger proportion, a black, which, on the ſlighteſt further addition of the chalybeate, becomes a full green. The different colours produced by different proportions of the chalybeate account for the different reſults obtained by Dr. Lewis and Dr. Irving, and prove, from the green colour which the latter obſerved in experiments with old preparations, while the recent ones ſtruck a black, that the principle on which the change of colour depends is exceedingly deſtructible. In the filtered decoction, infuſion of galls produced a pulverulent, and ſolution of gelatine a copious, filamentous precipitate.

The principles therefore proved to exiſt in Cinchona bark, ſeem to be cinchonin, tannin, an acid (the gallic ?), and a matter pre-

cipitable from the tincture by water (a resin?). Its aroma has also been proved to depend on a very minute proportion of volatile oil.

Medical use.—On dead animal matter it acts as an antiseptic, and on the living body it acts moreover as a stimulant, tonic, and antispasmodic. The discovery of its medical virtues was, in all probability, the result of accident; and in fact, according to some, the Peruvians learned the use of the bark by observing certain animals affected with intermittents instinctively led to it; while others say, that a Peruvian having an ague, was cured by happening to drink of a pool which, from some trees having fallen into it, tasted of cinchona: and its use in gangrene is said to have originated from its curing one in an aguish patient. About the year 1640, the lady of the Spanish viceroy, the Comitissa del Cinchon, was cured by the bark, which was therefore called Cortex or Pulvis Comitissæ, Cinchona, &c.; and from the interest which Cardinal de Lugo and the Jesuit fathers took in its distribution, Cortex or Pulvis Cardinalis de Lugo, Jesuiticus, Patrum, &c.; from the place where it was originally found, Peruvian bark, or simply, from its pre-eminence, Bark.

On its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became very universally established.

It was first introduced for the cure of intermittent fevers; and these, when properly exhibited, it rarely fails to cure. But there have been considerable differences with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it between the fits; the dose being the more frequent and larger according to their frequency; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, upon the whole appears preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It is now given, from the very commencement of the disease, without previous evacuations, which, with the delay of the bark, or under doses of it, by retarding the cure, often seem to induce abdominal inflammations, scirrhus, jaundice, hectic, dropsy, &c. symptoms formerly imputed to the premature or intemperate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return. Its use is then to be gradually left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, there

often ſeems to be a peculiar diſpoſition; and eſpecially when the wind blows from the eaſt. Although, however, evacuation rather counteracts the effects of cinchona in the uſe of intermittents, yet, previous to its uſe, it is adviſable to empty the alimentary canal, particularly the ſtomach: and on this account good effects are often obtained from premiſing an emetic.

It is a medicine which ſeems not only ſuited to both formed and latent intermittents, but to that ſtate of fibre on which all rigidly periodical diſeaſes ſeem to depend; as periodical pain, inflammation, hæmorrhagy, ſpaſm, cough, loſs of external ſenſe, &c.

Cinchona is now uſed by ſome in all continued fevers; at the ſame time attention is paid to keep the bowels clean, and to promote when neceſſary, the evacuation of redundant bile, always, however, ſo as to weaken the patient as little as poſſible.

In confluent ſmall-pox, it promotes languid eruption and ſuppuration, diminiſhes the fever through the whole courſe of it, and prevents or corrects putreſcence and gangrene.

In gangrenous ſore throats, and indeed in every ſpecies of gangrene, it is much uſed, both externally and internally.

In contagious dyſentery, after due evacuation, it has been uſed, taken internally and by injection, with and without opium.

In all thoſe hæmorrhagies called paſſive, and which, it is allowed, all hæmorrhagies are very apt to become, and likewiſe in other increaſed diſcharges, it is much uſed; and in certain undefined caſes of hæmoptyſis, ſome allege that it is remarkably effectual when joined with an abſorbent.

It is uſed for obviating the diſpoſition to nervous and convulſive diſeaſes; and ſome have great confidence in it, joined with ſulphuric acid, in caſes of phthiſis, ſcrofula, ill-conditioned ulcers, rickets, ſcurvy, and in ſtates of convaleſcence. In theſe caſes, it is proper to conjoin it with a milk diet.

In dropſy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacuants, and by its early exhibition after the water is once drawn off, or even begins to be freely dicharged, a freſh accumulation is prevented, and a radical cure obtained.

Mr. Pearſon of the Lock hoſpital praiſes very highly the powers of this remedy in different forms of the venereal diſeaſe; in reducing incipient bubo, in cleanſing and healing ulcers of the tonſils, and in curing gangrenous ulcers from a venereal cauſe. But in all theſe caſes mercury muſt alſo be given to eradicate the venereal virus from the ſyſtem.

Peruvian bark may be exhibited,

1. In ſubſtance.

The beſt form of exhibiting this valuable remedy is in the ſtate

of a very fine powder, in doſes of from ten grains to two drachms and upwards. Mutis and Zea ſay, that two drachms of true yellow bark in powder are ſufficient to prevent the acceſs of an intermittent, while, to produce the ſame effect, it requires the decoction of two ounces. Nay, even the reſiduum of an infuſion is capable of curing agues, provided it be given in a larger doſe, than the entire powder. As it cannot be ſwallowed in the form of a dry powder, it muſt either be diffuſed in ſome liquid, as water, wine, or milk, or mixed with ſome viſcid ſubſtance, as currant jelly. Its taſte, which is diſagreeable to many people, is beſt avoided by taking it immediately after it is mixed up; for by ſtanding any time, it is communicated to the vehicle. In this reſpect, therefore, it is better for the patients to mix it up themſelves, than to receive it from the apothecary already made up into a draught with ſome ſimple diſtilled water, or into an electuary with a ſyrup. A much more important objection to this form of giving Cinchona is, that ſome ſtomachs will not bear it, from the oppreſſion, and even vomiting, which in theſe caſes it excites. We muſt endeavour to obviate this inconvenience by the addition of ſome aromatic, and by giving it in ſmall doſes more frequently repeated. If we are unable to ſucceed by theſe means, we muſt extract the moſt active conſtituents of the bark by means of ſome menſtruum. It has therefore long been a pharmaceutical problem to diſcover which menſtruum extracts the virtues of Cinchona moſt completely. But the active conſtituents of this remedy, according to the beſt and lateſt analyſis, are cinchonin, tannin, and gallic acid, combined with ſome mucilage and reſin. Of theſe the two laſt are not ſoluble in any one menſtruum; but they moſt probably contribute very little to the powers of the medicine. The three other conſtituents, on the contrary, on which all its activity depends, taken ſingly, are all of them very ſoluble, both in water and in alcohol, and in every mixture of theſe. But it would be contrary to analogy to ſuppoſe, that theſe ſubſtances ſhould ſubſiſt ſo intimately mixed as they muſt be in an organic product, without exerting upon each other ſome degree of chemical affinity, and forming combinations poſſeſſed of new properties. Accordingly, we find, whether it ariſe from this cauſe, or merely from the ſtate of aggregation, that neither water nor alcohol extract theſe conſtituents from Cinchona bark in the ſame quantity in which they are able to diſſolve them ſeparately, and that we muſt have recourſe to direct experiment to determine the degree of action poſſeſſed by each menſtruum upon it. With this view many experiments have been made, and by very able chemiſts. But moſt of them were performed when the ſcience of chemiſtry was but in its infancy; and even at this time that branch of it which relates to theſe ſub-

ftances is fo little underftood, that the refults of the lateft experiments are far from conclufive.

2. In infufion.

To thofe whofe ftomachs will not bear the powder, this is the beft form of exhibiting Cinchona bark. Water, at a given temperature, feems capable of diffolving only a certain quantity, and therefore we are not able to increafe the ftrength of an infufion, either by employing a larger quantity of the bark, or allowing them to remain longer in contact. One part of bark is fufficient to faturate fixteen of water in the courfe of an hour or two. To accelerate the action of the water, it is ufual to pour it boiling hot upon the bark, to cover it up, and allow it to cool flowly. After ftanding a fufficient length of time, the infufion is decanted off for ufe. The propriety of this procefs may, however, be doubted, for if a cold infufion be boiled, or even gently heated, it acquires a deeper colour, and lets fall a refinous matter, in part infoluble in alcohol and in water. The infufion in water is however liable to one very great objection, that it cannot be kept even a very fhort time without being decompofed and fpoiled. Therefore, in fome inftances, we prepare the infufion with wine; and it fortunately happens that very often the ufe of the menftruum is as much indicated as that of the folvend. Cinchona alfo prevents wine from becoming acid, but in the courfe of a few days throws down its colouring matter, as gall nuts and charcoal do.

3. In tincture.

The great activity of the menftruum in this preparation, prevents the bark from being given in fufficiently large dofes to exert its peculiar virtues. It is, however, a powerful ftimulant.

4. In decoction.

Water of the temperature of 212° is capable of diffolving a much larger proportion of the foluble parts of Cinchona bark than water at 60°. But the folvent powers even of boiling water have their limits, and by protracting the decoction we do not increafe its ftrength, but rather, by diminifhing the quantity of the menftruum, we leffen the quantity of matter diffolved. Befides, at a boiling temperature, fome of the active conftituents are diffipated, while others abforb oxygen rapidly from the atmofphere, and are converted into what feems to be an infoluble and inert refinous fubftance.

5. In extract.

In this preparation we expect to poffefs the virtues of Cinchona bark in a very concentrated ftate. The principal objections to its ufe are its great expence, and the decompofition and deftruction of the active conftituents of the bark during the preparation, even when moft carefully conducted. Not above half the weight of

the dry extract is again soluble in water. It is convenient for the formation of pills and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally Cinchona bark is used in substance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyster it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of Cinchona bark, or to direct its efficacy to a particular purpose, or to correct some inconveniencies occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a useful addition; when it purges, opium; when it oppresses the stomach, aromatics; and when it induces costiveness, rhubarb. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphuric acid, super-sulphate of alumina and potass (alum), muriate of ammonia, carbonate of potass, tartrate of potass, tartrate of antimony and potass (tartar emetic), iron, lime-water, astringents, &c. have been frequently prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to the expected effects.

Off. prep.—Infus. *Ed. Dub.* Decoct. *Ed. Lond. Dub.* Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct. ammon. *Lond.* Extract. *Ed.* E. molle, *Lond. Dub.* E. durum, *Lond. Dub.* E. cum resina, *Lond.* Vin. gent. comp. *Ed.*

Sp. 4. CINCHONA CARIBÆA. *Ed.*
Cinchona of the Caribæan islands.
Off.—Cortex. The bark.

THIS tree is found in the Caribæan islands. It grows to a very large size. Dr. Wright, to whom we are indebted for all our knowledge of it, found some in the parish of St. James's, Jamaica, fifty feet high, and proportionally thick. The wood is hard, clouded, and takes a fine polish. The bark of the large trees is rough, the cuticle thick and inert, and the inner bark thinner than that of the young trees, but more fibrous. The bark is brought to us in pieces about a span in length, rolled together, and a line or half a line in thickness, of a brown colour on the surface, which is most commonly covered with white lichens: internally it is of a dark-brown colour, and very fibrous in its fracture. It has at first a sweetish taste, but after being chewed sometime it

becomes extremely nauſeous and bitter. Dr. Wright ſays he made uſe of this bark in all caſes where Peruvian bark was indicated, and with the greateſt ſucceſs. It has often been confounded with the cinchona floribunda (Willdenow's 7th ſpecies), ſo excellently analyſed by Fourcroy, under the title of the Cinchona of St. Domingo, and which, taken internally, is apt to excite vomiting and purging.

CISSAMPELOS PAREIRA. *Pareira Brava. Lond.*

Pareira brava.

Off.—Radix. The root.

Dioecia Monadelphia.—Nat. ord. *Sarmentaceæ.*

This is a perennial climbing plant, which grows in the Weſt-India iſlands, and in South America. The root, which is officinal, is brought to us from Brazil, in pieces of different ſizes, ſome no bigger than one's finger, others as large as a child's arm; it is crooked, and variouſly wrinkled on the ſurface; outwardly of a dark colour, internally of a dull yellowiſh, and interwoven with woody fibres; ſo that, upon a tranſverſe ſection, a number of concentric circles appear, croſſed with fibres, which run from the centre to the circumference. It has no ſmell; the taſte is a little bitteriſh, blended with a ſweetneſs like that of liquorice. Neumann got from 480 parts 123 alcoholic, and 60 watery extract; and inverſely, 140 watery, and 66 alcoholic. Nothing roſe in diſtillation.

Medical uſe.—The root is highly extolled by the Americans and Portugueſe, in a great variety of diſeaſes, particularly againſt ſuppreſſions of urine, nephritic pains, and calculus. Geoffroy alſo found it uſeful in nephritic diſorders, in ulcers of the kidneys and bladder, in humoral aſthmas, and in ſome ſpecies of jaundice. The common people of Jamaica uſe a decoction of the roots for pains and weakneſs of the ſtomach, proceeding from relaxation. The doſe of the root in ſubſtance is from twelve grains to half a drachm; in decoction, to two or three drachms.

CISTUS CRETICUS. *Ladanum. Lond.*

Cretan Ciſtus. Ladanum.

Off.—Reſina. The reſin.

Willd. g. 1048, *ſp.* 13.—Nat. ord. *Aſcyroideæ.*

This is a perennial ſhrub, which grows in Syria, and more eſpecially in the Grecian iſlands.

This reſin is ſaid to have been formerly collected from the beards of goats which browſed the leaves of the ciſtus: at preſent a kind of rake, with ſeveral ſtraps or thongs of ſkins fixed to it, is drawn lightly over the ſhrub, ſo as to take up the unctuous

juice, which is afterwards ſcraped off with knives. It is rarely met with pure, even in the places where it is produced; the duſt, blown upon the plant by the wind, mingling with the viſcid juice, and the inhabitants alſo being ſaid to mix it with a certain black ſand. In the ſhops two ſorts are met with: the beſt (which is very rare) is in dark-coloured, almoſt black, maſſes, of the conſiſtence of a ſoft plaſter, which grows ſtill ſofter upon being handled; of a very agreeable ſmell, and of a light, pungent, bitteriſh, taſte: the other ſort is harder, not ſo dark-coloured, in long rolls coiled up: this is of a much weaker ſmell than the firſt, and has a large admixture of a fine ſand, which in the ladanum examined by the French academy, made up three fourths of the maſs; and that found in the ſhops ſeems even more ſandy. What Neumann examined, however, gave him 5400 alcoholic, and 480 watery; and inverſely, 960 watery, and 4960 alcoholic extract, from 7680 parts. In diſtillation water carries over a volatile oil, and alcohol diſtilled from it becomes milky on the addition of water.

Off. prep.—Emplaſt. lad. comp. *Lond.* E. picis Burgund. *Lond.*

CITRUS.

Polyadelphia Icoſandria.—Nat. ord. *Pomaceæ.*

Sp. Citrus Aurantium. *Ed.* *Syn.* *Aurantium Hiſpalenſe.* *Lond. Dub.*

Seville orange.

Off.—Fructûs, ſuccus, et ejus cortex exterior, *Ed.* Folium, flos, fructûs, ſuccus, et cortex exterior, *Lond.* Fructûs, ſuccus, et cortex exterior, fructus immaturus, florum aqua ſtillatitia, *Dub.* The leaves, flowers, diſtilled water, and eſſential oil of the flowers, the juice and outer rind of the fruit, and the unripe fruit.

The orange tree is a beautiful evergreen, a native of Aſia, but now abundantly cultivated in the ſouthern parts of Europe, and in the Weſt-India iſlands. There are ſeveral varieties of this ſpecies, but they may be all referred to the bitter or Seville orange, and the ſweet or China orange.

The leaves are neither ſo aromatic nor ſo bitter as the rind of the fruit.

The flowers (flores naphæ) are highly odoriferous, and have been for ſome time paſt in great eſteem as a perfume; their taſte is ſomewhat warm, accompanied with a degree of bitterneſs. They yield their flavour by infuſion to rectified ſpirit, and in diſtillation both to ſpirit and water (aqua florum naphæ): the bitter matter is diſſolved by water, and on evaporating the decoction, remains entire in the extract.

A very fragrant red-coloured oil, diſtilled from theſe flowers, is brought from Italy, under the name of *Oleum* or *Eſſentia Neroli*; but oil of behen, in which orange flowers have been digeſted, is frequently ſubſtituted for it: the fraud, however, is eaſily detected, as the real oil is entirely volatile, and the adulterated is not.

The juice of oranges is a grateful acid liquor, conſiſting principally of citric acid, ſyrup, extractive, and mucilage.

The outer yellow rind of the fruit is a grateful aromatic bitter.

The unripe fruit dried are called Curaçoa oranges. They vary in ſize from that of a pea to that of a cherry. They are bitterer than the rind of ripe oranges, but not ſo aromatic, and are uſed as a ſtomachic.

Medical uſe.—The leaves have been celebrated by eminent phyſicians, as a powerful antiſpaſmodic in convulſive diſorders, and eſpecially in epilepſy; with others they have entirely failed. Orange flowers were at one time ſaid to be an uſeful remedy in convulſive and epileptic caſes; but experience has not confirmed the virtues attributed to them. As by drying they loſe their virtues, they may be preſerved for this purpoſe, by packing them cloſely in earthen veſſels, with half their weight of muriate of ſoda. The juice of the fruit is of conſiderable uſe in febrile or inflammatory diſtempers, for allaying heat, quenching thirſt, and promoting the ſalutary excretions: it is likewiſe of uſe in genuine ſcorbutus, or ſea-ſcurvy. Although the Seville, or *bitter orange*, as it is called, has alone a place in our pharmacopœias, yet the China, or ſweet orange, is much more employed. Its juice is milder, and leſs acid; and is very frequently uſed in its moſt ſimple ſtate with great advantage. Dr. Wright applied the roaſted pulp as a poultice to fetid ſores, in the Weſt Indies, with very great ſucceſs.

The rind proves an excellent ſtomachic and carminative, promoting appetite, warming the habit, and ſtrengthening the tone of the viſcera. Orange-peel appears to be conſiderably warmer than that of lemons, and to abound more with eſſential oil; to this circumſtance, therefore, due regard ought to be had in the uſe of theſe medicines. The flavour of the firſt is likewiſe ſuppoſed to be leſs periſhable than that of the other.

Off. prep. of the rind.—Syr. cort. aurantii, *Lond. Dub.* Aq. deſtil. *Ed.* Spiritus raph. comp. *Lond. Dub.* Tinctura cort. A. *Lond. Dub.* Tinct. cinch. comp. *Lond. Dub.* Tinct. gent. comp. *Ed.* Conſerva cort. A. *Ed. Lond. Dub.*

Of the juice.—Succ. coch. comp. *Lond. Ed.*

Sp. Citrus Medica. *Ed.* *Syn. Limon. Lond. Dub.* Lemon tree.

Off.—Fructus, cortex fructûs, et ejus oleum volatile. The juice and outer rind of the fruit, and the volatile oil of the outer rind.

The juice of lemons is ſimilar in quality to that of oranges, from which it differs little otherwiſe than in containing more citric acid and leſs ſyrup. The quantity of the former is indeed ſo great, that the acid has been named from this fruit, Acid of Lemons, and is commonly prepared from it. The ſimple expreſſed juice will not keep, on account of the ſyrup, extractive, and mucilage, and quantity of water which it contains, which cauſes it to ferment.

It was therefore extremely deſirable that an eaſy method ſhould be diſcovered of reducing it to ſuch a ſtate that it would not ſpoil by keeping, and would be leſs bulky.

Various means have been propoſed and practiſed with this view. The juice has been evaporated to the conſiſtence of rob; but this always gives an empyreumatic taſte, and does not ſeparate the extractive or mucilage, ſo that it is ſtill apt to ferment when agitated on board of ſhip in tropical climates. It has been expoſed to froſt, and part of the water removed under the form of ice; but this is liable to all the former objections, and beſides, where the lemons are produced in ſufficient quantity, there is not a ſufficient degree of cold. The addition of a quantity of alcohol to the inſpiſſated juice ſeparates the mucilage, but not the extractive or ſugar. By means, however, of Scheele's proceſs, as reduced to determinate quantities by Prouſt, we can obtain the acid perfectly pure and cryſtallized.

To 94 parts of lemon juice, 4 parts of carbonate of lime are to be added: the carbonic acid is ſeparated by effervefcence, and a quantity of inſoluble citrate of lime is precipitated. By evaporating the ſupernatant liquor, another portion of citrate of lime is obtained. Theſe added together amount to about 7½ parts, and require 20 parts of ſulphuric acid, of the ſpecific gravity of 1.15, to decompoſe them. The ſulphate of lime, being nearly inſoluble, is precipitated, while the citric acid remains in ſolution, and is to be ſeparated by waſhing, and cryſtallized by evaporation. If too much ſulphuric acid be added, when the liquor is much concentrated, it reacts upon the citric acid, and chars a portion of it. When this is the caſe, a little chalk muſt be added.

By this, or ſome ſimilar proceſs, it is now manufactured in this country, in large quantities, and ſold under the name of Coxwell's Concrete Salt of Lemons.

The yellow peel is an elegant aromatic, and is frequently em-

ployed in ftomachic tinctures and infufions: it is confiderably lefs hot than orange peel, and yields in diftillation with water a fmaller quantity of effential oil: its flavour is neverthelefs more perifhable, yet does not arife fo readily with fpirit of wine; for a fpiritous extract made from lemon-peel poffeffes the aromatic tafte and fmell of the fubject in much greater perfection than an extract prepared in the fame manner from the peels of oranges.

Citric acid is a powerful and agreeable antifeptic. Its powers are much increafed, according to Dr. Wright, by faturating it with muriate of foda. The mixture he recommends as poffeffing very great efficacy in dyfentery, remittent fever, the belly-ach, putrid fore throat, and as being perfectly fpecific in diabetes and lienteria. Citric acid is often ufed with great fuccefs for allaying vomiting: with this intention it is mixed with carbonate of potafs, from which it expels the carbonic acid with effervefcence. This mixture fhould be drunk as foon as it is made; or the carbonic acid gas, on which actually the anti-emetic power of this mixture depends, may be extricated in the ftomach itfelf, by firft fwallowing the carbonate of potafs diffolved in water, and drinking immediately afterwards the citric acid properly fweetened. The dofes are about a fcruple of the carbonate diffolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is alfo an ingredient in many pleafant refrigerant drinks, which are of very great ufe in allaying febrile heat and thirft. Of thefe, the moft generally ufeful is lemonade, or diluted lemon-juice, properly fweetened. Lemonade, with the addition of a certain quantity of any good ardent fpirit, forms the well-known beverage punch, which is fometimes given as a cordial to the fick. The German writers order it to be made with arrack, as rum and brandy, they fay, are apt to occafion headach. But the fact is directly the reverfe, for of all fpirits, arrack is moft apt to produce headach. The lighteft and fafeft fpirits are thofe which contain leaft effential oil, or other foreign matters, and which have been kept the longeft time after their diftillation.

Off. prep. of the rind.—Aq. deft. *Ed.* Spt. ammon. comp. *Ed. Lond. Dub.* *Of the juice.*—Syr. citr. med. *Ed. Lond. Dub.* Succ. fpiffat. *Lond.* *Of the oil.*—Ungt. fulph. *Ed.* Ungt. helleb. alb. *Lond. Dub.*

COCCUS CACTI. *Ed.* *Syn. Coccinella. Lond.*
Cochineal.

Cochineal is the dried body of the female of a hemipterous infect. It is found only in Mexico, and is nourifhed entirely on the leaves of the opuntia or nopal (cactus coccinelliferus). The

wild cochineal, which is covered with a ſilky envelope, is leſs valuable than the cultivated cochineal, which is without that covering, but grows to a larger ſize, and furniſhes a finer and more permanent colour. The Spaniards endeavour to confine both the inſect and the plant on which it feeds to Mexico. But this attempt at monopoly will, we hope, be fruſtrated by the exertions of ſome gentlemen in the Eaſt-Indies. The male only is furniſhed with wings, the female has none, and remains conſtantly attached to the leaf of the cactus. During winter, the Mexicans preſerve theſe inſects, with the ſucculent leaves to which they are attached, in their houſes. In ſpring, after the rainy ſeaſon is over, they are transferred to the living plants, and in a few days they lay innumerable eggs, and die. They are collected three times in the year; firſt, the dead mothers are gathered as ſoon as they have laid their eggs; in three or four months, the young which have grown to a ſufficient ſize are collected; and in three or four months more, all the young are collected, large and ſmall indiſcriminately, except thoſe which they preſerve for breeding next year. They are killed by incloſing them in a bag and dipping them in hot water, and by expoſing them on iron plates to the heat of the fire. 800,000 pounds are brought annually to Europe; and each pound contains at leaſt 70,000 inſects. From their appearance, when brought to us, they were long ſuppoſed to be the ſeed of ſome plant. They are ſmall, irregular, roundiſh bodies, of a blackiſh-red colour on the outſide, and a bright purple red within. Their taſte is acrid, bitteriſh, and aſtringent. They are uſed chiefly for the ſake of the fine colour which they produce, and they are principally conſumed by the ſcarlet dyers. In pharmacy they are employed to give a beautiful red to ſome tinctures. Their colour is eaſily extracted, both by alcohol, water, and water of ammonia; and in the dried inſect it is not impaired by keeping for any length of time.

Neumann got from 1920 grains 1440 watery extract; and in another experiment, from the ſame quantity 1430 alcoholic. The former was extremely gelatinous.

Medical uſe.—They have been lately recommended as an anodyne.

Off. prep.—Tinct. card. comp. *Lond. Dub.* Tinct. ariſt. ſerp. *Ed.* Tinct. cinchon. comp. *Lond.* Tinct. gent. comp. *Ed.* Tinct. helleb. *Ed. Lond. Dub.* Tinct. canth. *Lond.*

COCHLEARIA.

Willd. g. 1228. *Tetradynamia Siliculoſa.*—Nat. ord. *Siliquoſæ.*

Sp. 1. Cochlearia Officinalis. *Ed.* *Syn. Cochlearia. Dub. Cochlearia hortensis. Lond.*

Green scurvy-grass.

Off.—Herba. The plant.

This is an annual plant, which grows on the sea-shore of the northern countries of Europe, and is sometimes cultivated in gardens. As long as it is fresh it has a peculiar smell, especially when bruised, and a kind of saline acrid taste, which it loses completely by drying, but which it imparts by distillation to water or alcohol. It also furnishes an essential oil, the smell of which is so strong as to make the eyes water.

Med. use.—The fresh plant is a gentle stimulant and diuretic, and is chiefly used for the cure of sea-scurvy. It is employed externally as a gargle in sore throat, and scorbutic affections of the gums and mouth. It may be eaten in substance in any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation.

Off. prep.—Succus coch. comp. *Lond. Ed.* Spirit raph. comp. *Lond. Dub.*

Sp. 8. Cochlearia Armoracia. *Ed.* *Syn. Raphanus rusticanus. Lond. Dub.*

Horse-radish.

Off—Radix. The root.

This perennial plant is sometimes found wild about river sides, and other moist places: for medicinal and culinary uses, it is cultivated in gardens. It flowers in June, but rarely perfects its seeds in this country. Horse-radish root has a quick pungent smell, and a penetrating acrid taste; it nevertheless contains in certain vessels a sweet juice, which sometimes exudes upon the surface. Both water and alcohol extract its virtues by infusion. By drying, it loses all its acrimony, becoming first sweetish, and afterwards almost insipid: if kept in a cool place, covered with sand, it retains its qualities for a considerable time.

3840 parts, according to Neumann, were reduced by drying to 1000, and gave of watery extract 480, and 15 of alcoholic, and inversely, 420 alcoholic, and 480 watery; all these extracts were sweetish, without pungency. About 15 of volatile oil, extremely pungent, and heavier than water, arose in distillation with water.

Medical use.—This root is an extremely penetrating stimulus. It excites the solids, and promotes the fluid secretions; it seems to extend its action through the whole habit, and affects the minutest glands. It has frequently been of service in some kinds of scurvies and other chronic disorders, supposed to proceed from a viscidity of the juices, or obstructions of the excretory ducts. Sydenham

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recommends it likewise in dropsies, particularly those wh ch sometimes follow intermittent fevers.

Off. prep.—Spirit. raph. comp. *Lond. Dub.*

COCOS BUTYRACEA. *Syn. Palma. Ed.*

Palmæ.—Nat. ord. *Palmæ.*

The mackaw tree.

Off.—Nucis oleum fixum. The fixed oil of the nut, commonly called Palm oil.

THIS tree is a native of South America. The fruit is triangular, yellow, and as big as a plumb. The nut or kernel yields the oleum palmæ of the shops. It is first slightly roasted and cleaned, and then ground to a paste, first in a mill, then on levigating stone. This paste is gently heated, and mixed with $\frac{1}{10}$ its weight of boiling water put into a bag, and the oil expressed between two heated plates of iron. It yields $\frac{7}{10}$ or $\frac{8}{10}$ of oil. If coloured, this oil may be purified by filtration when melted. It then has the consistence of butter, a golden yellow colour, the smell of violets, and a sweetish taste. When well-preserved, it keeps several years without becoming rancid. When spoiled, it loses its yellow colour and pleasant smell. It is said to be often imitated with axunge, coloured with turmeric, and scented with Florentine iris root. It is rarely used in medicine, and only externally as an emollient ointment.

COLCHICUM AUTUMNALE. *Ed.* *Syn. Colchicum. Lond. Dub.*

Willd. g. 707, *sp.* 1. *Hexandria Trigynia.*—Nat. ord. *Liliaceæ.*

Meadow saffron.

Off.—Radix. The root.

MEADOW SAFFRON is a perennial bulbous-rooted plant, which grows in wet meadows in the temperate countries of Europe. It flowers in the beginning of autumn, at which time the old bulb begins to decay, and a new bulb to be formed. In the following May the new bulb is perfected, and the old one wasted and corrugated. They are dug for medical use in the beginning of summer. The sensible qualities of the fresh root are very various, according to the place of growth, and season of the year. In autumn it is inert; in the beginning of summer, highly acrid: some have found it to be a corrosive poison; others have eaten it in considerable quantity without experiencing any effect. When it is possessed of acrimony, this is of the same nature with that of garlic, and is entirely destroyed by drying.

Medical uſe.—Störk, Collin, and Plenk, have celebrated its virtues as a diuretic in hydrothorax and other dropſies. But it is at beſt a very uncertain remedy. The expreſſed juice is uſed in Alſace to deſtroy vermin in the hair.

Off. prep.—Syr. colch. autumn. *Ed.* Oxymel colchici, *Lond.*

COLOMBA. *Lond. Ed.* *Columbo. Dub.*

Colomba.

Off.—Radix. The root.

THIS is the root of an unknown plant, which, however, is conjectured by Willdenow to be a ſpecies of bryonia. It was ſuppoſed to have its name from a city in Ceylon, from which it is ſent over all India. But more recent accounts ſay, that it is produced in Africa, in the country of the Caffres, and that it forms an important article of commerce with the Portugueſe at Mozambique, in the province of Tranquebar. It is generally brought in tranſverſe ſections, from half an inch to three inches in diameter, rarely divided horizontally. This is evidently done to facilitate its drying, for the large pieces are all perforated with holes. The bark is wrinkled and thick, of a dark brown colour on the outſide, and bright yellow within. The pith in the centre is ſpongy, yellowiſh, and ſlightly ſtriped. Its ſmell is ſlightly aromatic, and readily loſt when not preſerved in cloſe veſſels; its taſte is unpleaſant, bitter, and ſomewhat acrid; the bark has the ſtrongeſt taſte; the pith is almoſt mucilaginous. Its eſſential conſtituents are cinchonin, and a great deal of mucilage. It is accordingly more ſoluble in water than in alcohol. The tincture is not precipitated by water, and does not affect the colour of infuſion of turnſole, or ſolution of red ſulphate of iron.

Med. uſe.—In India it is much uſed in diſeaſes attended with bilious ſymptoms, particularly in cholera; and it is ſaid to be ſometimes very effectual in other caſes of vomiting. It often produces excellent effects in dyſpepſia. Half a drachm of the powder is given repeatedly in the day.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CONIUM MACULATUM. *Ed.* *Syn. Cicuta. Lond. Dub.*

Willd. g. 533, *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Hemlock.

Off.—Folium, ſemen, flos. The leaf, flower, and ſeed.

THIS is a large biennial umbelliferous plant, which grows very commonly about the ſides of fields, under hedges, and in moiſt ſhady places. As it may eaſily be confounded with other plants of the ſame natural order, which are either more virulent, or leſs

active, we ſhall give a full deſcription of its botanical characters. The root is white, long, of the thickneſs of a finger, contains, when it is young, a milky juice, and reſembles both in ſize and form the carrot. In ſpring it is very poiſonous, in harveſt leſs ſo: The ſtalk is often three, four, and even ſix feet high, hollow, ſmooth, not beſet with hairs, and marked with red or brown ſpots. The leaves are large, and have long and thick foot-ſtalks, which, at the lower end, aſſume the form of a groove, and ſurround the ſtem. From each ſide of the foot-ſtalk other foot-ſtalks ariſe, and from theſe a ſtill ſmaller order, on which there are ſeſſile, dark-green, ſhining, lancet-ſhaped, notched leafits. The umbels are terminal and compound. The flowers conſiſt of five white heart-ſhaped leaves. The ſeeds are flat on the one ſide, and hemiſpherical on the other, with five ſerrated ribs. This laſt circumſtance, with the ſpots on the ſtalks, and the peculiar very nauſeous ſmell of the plant, ſomewhat reſembling the urine of a cat, ſerve to diſtinguiſh it from all other plants. We muſt not be miſled by its officinal name Cicuta, to confound it with the Cicuta viroſa of Linnæus, which is one of the moſt virulent plants produced in this country, and readily diſtinguiſhable from the conium, by having its roots always immerſed in water, which thoſe of the conium never are. The poſſibility of this miſtake ſhews the propriety of denominating all vegetables by their ſyſtematic names, as the Edinburgh college now do. The other plants which have been miſtaken for the conium maculatum are, the æthuſa cynapium, caucalis anthriſcus, and ſeveral ſpecies of chærophyllum, eſpecially the bulboſum, which, however, is not a native of this country.

Hemlock ſhould not be gathered unleſs its peculiar ſmell be ſtrong. The leaves ſhould be collected in the month of June, when the plant is in flower. The leafits are to be picked off, and the foot-ſtalks thrown away. The leafits are then to be dried quickly in a hot ſun, or rather on tin plates before a fire, and preſerved in bags of ſtrong brown paper, or powdered and kept in cloſe veſſels, excluded from the light; for the light ſoon diſſipates their green colour, and with it the virtues of the medicine.

Med. uſe.—Freſh hemlock contains not only the narcotic, but alſo the acrid principle; of the latter much, and of the former little, is loſt by drying. The whole plant is a virulent poiſon, but varying very much in ſtrength, according to circumſtances. When taken in an over-doſe, it produces vertigo, dimneſs of ſight, difficulty of ſpeech, nauſea, putrid eructations, anxiety, tremors, and paralyſis of the limbs. But Dr. Störk found, that in ſmall doſes it may be taken with great ſafety; and that, without at all diſordering the conſtitution, or even producing any ſenſible operation, it ſometimes proves a powerful remedy in many

obſtinate diſorders. In ſcirrhus, the internal and external uſe of hemlock has been found uſeful, but then mercury has been generally uſed at the ſame time. In open cancer it often abates the pain, and is free from the conſtipating effects of opium. It is likewiſe uſed in ſcrofulous tumours and ulcers, and in other ulcers that are only defined by the term ill-conditioned. It is alſo recommended by ſome in chincough, and various other diſeaſes. Its moſt common, and beſt form, is that of the powdered leaves, in the doſe at firſt of two or three grains a-day, which in ſome caſes has been gradually increaſed to upwards of two ounces a-day, without producing giddineſs. An extract from the ſeeds is ſaid to produce giddineſs ſooner than that from the leaves.

Off. prep.—Succ. ſpiſſat. con. maculat. *Ed. Lond. Dub.*

CONVOLVULUS.

Willd. g. 323. *Pentandria Monogynia.*—Nat. ord *Campanaceæ.*

Sp. 4. CONVOLVULUS SCAMMONIA. *Ed. Syn. Scammonium. Lond. Dub.*

Scammony.

Off.—Gummi-reſina. The gum-reſin.

THE ſcammony convolvulus is a climbing perennial plant, which grows in Syria, Myſia, and Cappadocia. The roots, which are very long and thick, when freſh contain a milky juice. To obtain this, the earth is removed from the upper part of the roots, and the tops of theſe are cut obliquely off. The milky juice which flows out, is collected in a ſmall veſſel ſunk in the earth at the lower end of the cut. Each root furniſhes only a few drachms, but it is collected from ſeveral veſſels, and dried in the ſun. This is the true and unadulterated ſcammony. It is light, of a dark grey colour, but becomes of a whitiſh yellow when touched with the wet finger, is ſhining in its fracture, has a peculiar nauſeous ſmell, and bitter acrid taſte, and forms with water a greeniſh milky fluid, without any remarkable ſediment. In this ſtate of purity it ſeldom reaches us, but is commonly mixed with the expreſſed juice of the root, and even of the ſtalks and leaves, and often with flour, ſand, or earth. The beſt to be met with in the ſhops comes from Aleppo, in light ſpongy maſſes, having a heavy diſagreeable ſmell, friable, and eaſily powdered, of a ſhining aſh colour verging to black; when powdered, of a light grey or whitiſh colour. An inferior ſort is brought from Smyrna in more compact ponderous pieces, with leſs ſmell, not ſo friable, and leſs eaſily powdered, of a darker colour, not ſo reſinous, and full of ſand and other impurities.

Reſin is the principal conſtituent of ſcammony. Sixteen

ounces of good Aleppo ſcammony, give eleven ounces of reſin, and three and a half of watery extract.

Medical uſe.—Scammony is an efficacious and ſtrong purgative. Some have condemned it as unſafe, and laid various ill qualities to its charge; the principal of which is, that its operation is uncertain, a full doſe proving ſometimes ineffectual, whilſt at others a much ſmaller one occaſions dangerous hypercatharſis. This difference, however, is owing entirely to the different circumſtances of the patient, and not to any ill quality, or irregularity of operation, of the medicine: where the inteſtines are lined with an exceſſive load of mucus, the ſcammony paſſes through, without exerting itſelf upon them; where the natural mucus is deficient, a ſmall doſe of this or any other reſinous cathartic, irritates and inflames. Many have endeavoured to diminiſh the activity of this drug, and to correct its imaginary virulence, by expoſing it to the fumes of ſulphur, diſſolving it in acids, and the like; but theſe only deſtroy a part of the medicine without making any alteration in the reſt. Scammony in ſubſtance, judiciouſly managed, ſtands not in need of any corrector: if triturated with ſugar, or with almonds, it becomes ſufficiently ſafe and mild in its operation. It may likewiſe be conveniently diſſolved, by trituration, in a ſtrong decoction of liquorice, and the ſolution then poured off from the feces. The common doſe of ſcammony is from three to twelve grains.

Off. prep.—Elect. ſcammon. *Lond. Dub.* Pulv. comp. *Lond. Ed. Dub.* Pulv. ſcam. cum aloe, *Lond.* Pulv. ſcam. cum calom. *Lond.* Extract. coloc. comp. *Lond.* Pulv. ſen. comp. *Lond.* Pil. aloes cum coloc. *Ed.*

Sp. 61. CONVOLVULUS JALAPA. *Ed.* *Syn. Jalapium. Lond. Jalapa. Dub.*

Jalap.

Off.—Radix. The root.

JALAP is another climbing perennial ſpecies of convolvulus. It is an inhabitant of Mexico and Vera Cruz. It is brought to us in thin tranſverſe ſlices, which are covered with a blackiſh wrinkled bark, and are of a dark grey colour internally, marked with darker or blackiſh ſtripes. It has a nauſeous ſmell and taſte; and when ſwallowed it affects the throat with a ſenſe of heat, and occaſions a plentiful diſcharge of ſaliva. When powdered it has a yellowiſh grey colour.

Such pieces ſhould be choſen as are moſt compact, hard, weighty, dark coloured, and abound moſt with black circular ſtriæ and ſhining points: the light, whitiſh, friable worm-eaten pieces muſt be rejected.

Slices of bryony root are ſaid to be ſometimes mixed with thoſe of jalap: but theſe may be eaſily diſtinguiſhed, by their whiter colour, and leſs compact texture.

Neumann got from 7680 parts, 2480 alcoholic, and then by water 1200; and inverſely, 2160 watery, beſides 360, which precipitated during the evaporation, and 1440 alcoholic: the tincture extracted from 7680 parts, when precipitated by water, gave 1920.

Medical uſe.—Jalap in ſubſtance, taken in a doſe of about half a drachm (leſs or more, according to the circumſtances of the patient), in plethoric, or cold phlegmatic habits, proves an effectual, and in general a ſafe purgative, performing its office mildly, ſeldom occaſioning nauſea or gripes, which too frequently accompany the other ſtrong cathartics. In hypochondriacal diſorders, and hot bilious temperaments, it gripes violently, if the jalap be good; but rarely takes due effect as a purge. An extract originally made by water purges almoſt univerſally, but weakly; and at the ſame time has a conſiderable effect by urine: what remains after this proceſs gripes violently. The pure reſin, prepared by alcohol, occaſions moſt violent gripings, and other diſtreſſing ſymptoms, but ſcarcely proves at all cathartic: triturated with ſugar, or with almonds, into the form of an emulſion, or diſſolved in ſpirit, and mixed with ſyrups, it purges plentifully in a ſmall doſe, without occaſioning much diſorder: the part of the jalap remaining after the ſeparation of the reſin, yields to water an extract, which has no effect as a cathartic, but operates powerfully by urine.

Off. prep.—Tinct. *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Ed.* Tinct. ſennæ comp. *Ed.*

COPAIFERA OFFICINALIS.

Willd. g. 880, *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Dumoſæ.*

Copaiva tree.

Off.—Reſina liquida, *Ed.* Balſamum copaiva, *Lond.* Balſamum copaiba, *Dub.* The reſin. Balſam of copaiva.

The tree which produces this reſin is a native of the Spaniſh Weſt-India iſlands, and of ſome parts of the continent of South America. It grows to a large ſize, and the reſinous juice flows in conſiderable quantities from inciſions made in the trunk.

The juice is clear and tranſparent, of a whitiſh or pale yellowiſh colour, an agreeable ſmell, and a bitteriſh pungent taſte. It is uſually about the conſiſtence of oil, or a little thicker; when long kept, it becomes nearly as thick as honey, retaining its clearneſs; but has not been obſerved to grow dry or ſolid, as moſt of the other reſinous juices do. The beſt reſin of copaiva comes from Brazil; but we ſometimes meet with a thick ſort, which is

not at all tranſparent, or much leſs ſo than the foregoing, and generally has a portion of turbid watery liquor at the bottom. This is probably either adulterated by the mixture of other ſubſtances, or has been extracted by decoction from the bark and branches of the tree: its ſmell and taſte are much leſs pleaſant than thoſe of the genuine reſin.

Pure reſin of copaiva diſſolves entirely in alcohol; the ſolution has a very fragrant ſmell. Diſtilled with water it yields a large quantity of a limpid eſſential oil, but no benzoic acid: it is therefore not a balſam, but a combination of reſin and volatile oil. Neumann ſays that it effervеſces with liquid ammonia.

Med. uſe.—The reſin of copaiva is an uſeful corroborating detergent medicine, but in ſome degree irritating. It ſtrengthens the nervous ſyſtem, tends to looſen the belly; in large doſes proves purgative, promotes urine, and cleans and heals exulcerations in the urinary paſſages, which it is ſuppoſed to perform more effectually than any of the other reſinous fluids. Fuller obſerves, that it gives the urine an intenſely bitter taſte, but not a violet ſmell, as the turpentines do.

This reſin has been principally celebrated in gleets, and the fluor albus, and externally as a vulnerary.

The doſe of this medicine rarely exceeds 20 or 30 drops, though ſome authors direct 60, or upwards. It may be conveniently taken in the form of an oleoſaccharum, or in that of an emulſion, into which it may be reduced, by triturating it with almonds, with a thick mucilage of gum-arabic, or with the yolk of eggs, till they are well incorporated, and then gradually adding a proper quantity of water.

CORIANDRUM SATIVUM. *Ed.* *Coriandrum. Lond. Dub.*
Willd. g. 552, *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*
Coriander.

Off.—Semen. The ſeeds.

Coriander is an annual, umbelliferous plant, a native of the ſouth of Europe, differing from all the others of that claſs, in producing *ſpherical* ſeeds. Theſe, when freſh, have a ſtrong diſagreeable ſmell, which improves by drying, and becomes ſufficiently grateful. They are recommended as carminative and ſtomachic.

Off. prep.—Infuſ. ſennæ tart. *Lond.* Inf. tamarindi cum ſenna, *Ed.* Tinct. ſen. comp. *Ed.* Elect. ſennæ, *Ed. Lond.*

CROCUS SATIVUS. *Ed.* *Crocus. Lond. Dub.*
Willd. g 92, *ſp* 1. *Triandria Monogynia.*—Nat. ord. *Liliaceæ.*
Common ſaffron.

Off.—Floris ſtigma, *Crocus* dictum. The ſummits of the piſtils, called Saffron.

Crocus is a bulbous-rooted perennial plant, probably a native of the Eaſt, although it is now found wild in England, and other temperate countries of Europe. It is very generally cultivated as an ornament to our gardens, and in ſome places for the ſaffron, which is formed of the dried ſummits of the piſtil, and not of the filaments, as ſtated by the Dublin college. Each flower has one piſtil, the ſummit of which is deeply divided into three ſlips, which are of a dark orange-red colour, verging to white at the baſe, and are ſmooth and ſhining. Their ſmell is pleaſant and aromatic, but narcotic; their taſte a fine aromatic bitter, and they immediately give a deep yellow colour to the ſalvia when chewed. The flowers are gathered early in the morning, juſt before they open; the ſummits of the piſtils are picked out, very carefully dried by the heat of a ſtove, and compreſſed into firm cakes. In this iſland the Engliſh ſaffron is ſuperior to what is imported from other countries, and may be diſtinguiſhed by its blades being broader.

On the continent they reckon the Auſtrian and the French from Gatinois the beſt. The Spaniſh is rendered uſeleſs, by being dipt in oil, with the intention of preſerving it. Saffron ſhould be choſen freſh, not above a year old, in cloſe cakes, neither dry, nor yet very moiſt; tough and firm in tearing; difficultly pulverizable; of a fiery, orange-red colour; of the ſame colour within as without; of a ſtrong, acrid, diffuſive ſmell; and capable of colouring a very large proportion of water or alcohol. Saffron which does not colour the fingers when rubbed between them, or ſtains them with oil, has little ſmell or taſte, or a muſty or foreign flavour, is too tender, and has a whitiſh, yellow, or blackiſh colour, is bad. It is ſaid that it is ſometimes adulterated with the fibres of ſmoked beef, and with the flowers of the carthamus tinctorius, calendula officinalis, &c. The impoſition may be detected by the abſence of the white ends, which may be obſerved in the real ſaffron, by the inferior colouring power, and by the want of ſmell, or bad ſmell when thrown on live coals.

By diſtillation with water, ſaffron furniſhes a ſmall proportion of eſſential oil, of a golden yellow colour, heavier than water, and poſſeſſing the characteriſtic ſmell in an eminent degree. According to Hermbſtaedt, the ſoluble matter of ſaffron is extractive nearly pure. Neumann obtained from 480 dried ſaffron 360 grains of watery extract which was ſoluble in alcohol, except 24 of a colourleſs matter like ſand, and afterwards 20 of alcoholic; and inverſely, 320 of alcoholic extract entirely ſoluble in water, and then 90 of watery.

On account of the great volatility of the aromatic part of the ſaffron, it ſhould be wrapt up in bladder, and preſerved in a box or tin caſe.

Medical use.—Saffron is a very elegant aromatic: besides the virtues which it has in common with all the bodies of that clafs, it has been alleged that it raifes the fpirits, and in large dofes occafions immoderate mirth, involuntary laughter, and the other effects which follow from the abufe of fpiritous liquors. It is faid to be particularly ferviceable in hyfteric depreffions, or obftructions of the uterine fecretions, where other aromatics, even thofe of the more generous kind, have little effect. But the experiments of Dr. Alexander and Dr. H. Cullen fhew, that it is much lefs powerful than was once imagined: fo that of late the eftimation in which it was held as a medicine has been on the decline.

Off. prep.—Syr. croci, *Lond.*. Tinct. croci, *Ed.* Tinctura aloes cum myrrha. *Ed. Lond.* Tinct. cinchon. comp. *Lond. Dub.* T. rhab. *Lond.* T. rhab. comp. *Lond.* T. aloes ætherea, *Ed.* Vin. rhab. *Lond.* Pil. aloes cum myrrha, *Lond. Ed.* Elect. aromat. *Dub.* Confect. aromat. *Lond.*

CROTON ELEUTHERIA. *Swartz. Prod. Ed. Cafcarilla. Lond. Dub.*

Monoecea Adelphia.—Nat. ord. *Tricoccæ.*

Eleutheria or cafcarilla.

Off.—Cortex. The bark.

THIS bark is imported into Europe from the Bahama iflands, and particularly from one of them of the name of Eleutheria; from which its trivial name is derived. But Dr. Wright alfo found the tree on the fea-fhore in Jamaica, where it is common, and rifes to about twenty feet in height. It is the Clutia eluteria of Linnæus: the bark of whofe Croton cafcarilla has none of the fenfible qualities of the cafcarilla of the fhops.

This bark is in general imported either in curled pieces or rolled up into fhort quills, about an inch in width, fomewhat refembling in appearance the Peruvian bark. Its fracture is fmooth and clofs, of a dark brown colour. It is covered with a rough whitifh epidermis; and in the infide it is of a brownifh caft.

It has a light agreeable fmell, and a moderately bitter tafte, with fome aromatic warmth. It burns readily, and yields, when burning, a very fragrant fmell, refembling that of mufk; a property which diftinguifhes the cafcarilla from all other barks.

Its active conftituents are aromatic volatile oil and bitter extractive. Its virtues are partially extracted by water, and totally by alcohol; but it is moft effectual when given in fubftance.

Medical use—It produces a fenfe of heat, and excites the action of the ftomach; and it is therefore a good and pleafant ftomachic, and may be employed with advantage in flatulent colics, internal hæmorrhagies, dyfenteries, diarrhœas, and fimilar diforders.

As the effential oil is diffipated in making the extract, this pre-

paration acts as a simple bitter. It was much employed by the Stahlians in intermittent fever, from their fear of using Cinchona bark, to which, however, it is much inferior in efficacy.

Off. prep.—Tinct. *Lond. Dub.* Extract, *Lond.*

CUCUMIS COLOCYNTHIS. *Ed.* *Colocynthis. Lond. Dub.*
Monoecia Syngenesia.—Nat. ord. *Cucurbitaceæ.*
Coloquintida, or bitter apple.

Fructus, cortice seminibusque abjectis. *Ed.* Fructus medulla. *Lond. Dub.* The medullary part of the fruit.

THIS is an annual plant of the gourd kind, a native of Turkey. The fruit is about the size of an orange; its medullary part, freed from the rind and seeds, is alone made use of in medicine; this is very light, white, spongy, composed of membranous leaves, of an extremely bitter, nauseous, acrimonious taste. It is gathered in autumn when it begins to turn yellow, and is then peeled and dried quickly, either in a stove or in the sun. In the latter case it should be covered with paper.

Neumann got from 7680 parts 1680 alcoholic extract, and then 2160 watery; and inversely, 3600 watery and 224 alcoholic.

Medical use.—Colocynth is one of the most powerful and most violent cathartics. Many eminent physicians condemn it as dangerous, and even deleterious: others recommend it not only as an efficacious purgative, but likewise as an alterative in obstinate chronical disorders. This much is certain, that colocynth, in the dose of a few grains, acts with great vehemence, disorders the body, and sometimes occasions a discharge of blood. Many attempts have been made to correct its virulence by the addition of acids, astringents, and the like: these may lessen the force of the colocynth, but no otherwise than might be equally done by a reduction of the dose. The best method of abating its virulence, without diminishing its purgative virtue, seems to be by triturating it with gummy farinaceous substances, or the oily seeds.

Off. prep.—Extract. col. comp. *Lond.* Pil. aloes cum colocynth, *Ed.*

CUMINUM CYMINUM. *Cuminum. Lond.*
Willd. g. 547, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Umbellatæ.*
Cummin.

Off.—Semen. The seeds.

THE cummin is an annual umbelliferous plant, in appearance resembling fennel, but much smaller. It is a native of Egypt; but the seeds used in Britain are brought chiefly from Sicily and Malta. Cummin seeds have a bitterish warm taste, accompanied with

an aromatic flavour, not of the moſt agreeable kind, reſiding in a volatile oil.

Off. prep.—Cataplaſm cum. *Lond.* Emplaſt. cum. *Lond.*

CUPRUM. *Lond. Dub. Ed.*

Copper.

COPPER is found in many countries.

a. In its metallic ſtate:

1. Cryſtallized.
2. Alloyed with arſenic and iron.
3. Sulphuretted.

b. Oxidized:

4. Uncombined.
5. Combined with carbonic acid.
6. ——————— ſulphuric acid.
7. ——————— arſenic acid.

The general properties of copper have been already enumerated.

Copper has a more perceptible ſmell and taſte than almoſt any other metal. Its effects when taken into the ſtomach are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting exceſſive nauſea, vomiting, colic pains, and purging, ſometimes of blood, or, though more rarely, obſtinate conſtipation. It alſo produces agitation of the mind, headach, vertigo, delirium; renders the pulſe ſmall and weak, the countenance pale, and cauſes fainting, convulſions, paralyſis, and apoplexy. When any of theſe ſymptoms occur, we muſt endeavour to obviate the action of the poiſon by large and copious draughts of oily and mucilaginous liquors, or to deſtroy its virulence by ſolutions of potaſs, or ſulphuret of potaſs.

Poiſoning from copper is moſt commonly the effect of ignorance, accident, or careleſſneſs; and too many examples are met with of fatal conſequences enſuing upon eating food which had been dreſſed in copper veſſels not well cleaned from the ruſt which they had contracted by lying in the air; or pickles, to which a beautiful green colour had been given, according to the murderous directions of the moſt popular cookery books, by boiling them with halfpence, or allowing them to ſtand in a braſs pan until a ſufficient quantity of verdegris was formed.

Great care ought to be taken that acid liquors, or even water, deſigned for internal uſe, be not ſuffered to ſtand long in veſſels made of copper, otherwiſe they will diſſolve ſo much of the metal

as will give them dangerous properties. But the ſure preventive of theſe accidents is to baniſh copper utenſils from the kitchen and laboratory. The preſence of copper in any ſuſpected liquor is eaſily detected by inſerting into it a piece of poliſhed ſteel, which will ſoon be coated with copper, or by dropping into it ſome carbonate of ammonia, which will produce a beautiful blue colour if any copper be preſent.

But although copper be thus dangerous, ſome preparations of it are in certain caſes uſed with great advantage both externally and internally.

The chief of theſe are,

1. The ſub-acetate of copper.
2. The ſulphate of copper.
3. The ſub-ſulphate of copper and ammonia.
4. The muriate of copper and ammonia.
5. A ſolution of the ſulphate of copper, and ſuper-ſulphate of alumina in ſulphuric acid.

As the two firſt of theſe are never prepared by the apothecary, but bought by him from the manufacturer, they are inſerted in the liſt of materia medica.

Sub-Acetis Cupri. *Ed.* *Ærugo.* *Lond. Dub.*
Sub-acetate of Copper. Verdegris.

The preparation of this ſubſtance was almoſt confined to Montpelier in France, owing chiefly to an excellent regulation which exiſted, that no verdegris could be ſold until it had been examined and found of ſufficiently good quality. For ſince that regulation has been aboliſhed, Chaptal informs us, that ſo many abuſes have crept into the manufacture, that the Montpelier verdegris has loſt its decided ſuperiority of character. It is prepared by ſtratifying copper plates with the huſks and ſtalks of the grape, which have been made to ferment after the wine has been expreſſed from them. In from ten to twenty days, when the huſks become white, the plates of copper are taken out, and their ſurfaces are found to be covered with detached and ſilky cryſtals. They are now placed on edge, with their ſurfaces in contact, in the corner of a cellar, and alternately dipt in water, and replaced to dry every ſeven or eight days, for ſix or eight times. By this management, the plates ſwell, and are everywhere covered with a coat of verdegris, which is eaſily ſeparated with a knife. In this ſtate it is only a paſte, and is ſold by the manufacturers to commiſſioners, who beat it well with wooden mallets, and pack it

up in bags of white leather, a foot high and ten inches wide, in which it is dried by expofing it to the air and fun, until the loaf of verdegris cannot be pierced with the point of a knife.

Sub-acetate of copper fhould be of a bluifh-green colour, dry and difficult to break, and fhould neither deliquefce, have a falt tafte, contain any black or white fpots, nor be adulterated with earth or gypfum. Its purity may be tried by diluted fulphuric acid, in which the fub-acetate diffolves entirely, and the impurities remain behind.

Verdegris, as it comes to us, is generally mingled with ftalks of the grape; they may be feparated, in pulverization, by difcontinuing the operation as foon as what remains feems to be almoft entirely compofed of them.

Medical ufe.—Verdegris is never or rarely ufed internally. Some writers highly extol it as an emetic, and fay, that a grain or two act as foon as received into the ftomach; but its ufe has been too often followed by dangerous confequences to allow of its employment. Verdegris applied externally, proves a gentle detergent and efcharotic, and is employed to deftroy callous edges, or fungous flefh in wounds. It is alfo advantageoufly applied to fcorbutic ulcers of the mouth, tongue, or fauces, and deferves to be carefully tried in cancerous fores. With thefe intentions it is an ingredient in different officinal compofitions.

Off. prep.—Oxymel aeruginis, *Lond.* Acid acetos. *Lond.* Aerug. ppt. *Lond.* Ungt. fub-acet. cupri, *Ed.* Empl. mel. vef. comp. *Ed.*

SULPHAS CUPRI. *Ed.* *Cuprum vitriolatum. Dub.* *Vitriolatum cœruleum. Lond.*

Sulphate of copper. Blue vitriol.

THIS metallic falt is rarely formed by combining directly its component parts; but it is obtained, either by evaporating mineral waters which contain it, or by acidifying native fulphuretted copper, by expofing it to the action of air and moifture, or by burning its fulphur.

When pure it has a deep blue colour, and is cryftallized generally in long rhomboids. It effloresces flightly in the air, is foluble in four parts of water at 60°, and in two at 212°, and is infoluble in alcohol. By heat it lofes, firft its water of cryftallization, and afterwards all its acid. It is decompofed by the alkalies and earths, and fome of the metals, the alkaline carbonates, borates, and phofphates, and fome metallic falts.

It is compofed of,

Copper, 24 }
Oxygen, 8 } 42 hydro-oxide of copper.
Water, 10 }
33 ſulphuric acid.
25 water of cryſtallization.

100

The ſulphate of copper has a ſtrong, ſtyptic, metallic taſte, and is chiefly uſed externally as an eſcharotic for deſtroying warts, callous edges, and fungous excreſcences, as a ſtimulant application to ill-conditioned ulcers, and as a ſtyptic to bleeding ſurfaces. Taken internally, it operates, in very ſmall doſes, as a very powerful emetic. It has, however, been exhibited in incipient phthiſis pulmonalis, intermittent fever, and epilepſy, but its uſe is not free from danger.

Off. prep.—Solutio ſulphatis cupri compoſita, *Ed.* Ammoniaretum cupri, *Ed. Lond. Dub.*

CURCUMA LONGA. *Curcuma. Lond.*

Willd. g. 11, *ſp.* 2. *Monandria Monogynia.*—Nat. ord. *Scitamineæ.*

Turmeric.

Off.—Radix. The root.

Turmeric is a perennial plant, a native of the Eaſt Indies. The roots are tuberous, knotty, and long, wrinkled, externally of a pale yellow colour, and internally of a ſhining ſaffron brown They have a weak aromatic ſmell, and a ſlightly bitter aromatic taſte. They contain a very little eſſential oil; and Neumann got from 960 parts, 320 watery, and afterwards 50 alcoholic extract, and inverſely 150 alcoholic, and 210 watery.

Medical uſe.—Turmeric, when taken internally, tinges the urine of a deep yellow colour, and acts as a gentle ſtimulant It has been celebrated in diſeaſes of the liver, jaundice, cachexy, dropſy, intermittent fevers, &c. But its internal uſe in this country is almoſt confined to its being a principal ingredient in the compoſition of curry powder, in which form it is uſed in immenſe quantities in the Eaſt Indies. It is alſo a valuable dye-ſtuff, and an excellent chemical teſt of the preſence of uncombined alkalies; for the yellow colour of turmeric is changed by them to a reddiſh brown.

CYNARA SCOLYMUS *Ed.* *Cinara. Lond.* *Cinara Hortenſis. Dub.*

Willd. g. 1436, *ſp.* 2. *Syngeneſia Polygamia æqualis.*—Nat. ord. *Compoſitæ capitatæ*

Artichoke.

Off.—Folium. The leaves.

The artichoke is a perennial plant, indigenous in the ſouth of Europe, but very frequently cultivated in our gardens for culinary purpoſes.

The leaves are bitter, and afford by expreſſion a conſiderable quantity of juice, which is ſaid to be diuretic, and to have been ſucceſsfully uſed in dropſy.

DAPHNE MEZEREUM. *Ed.* *Mezereum. Lond. Mezereon. Dub.*

Willd. g. 773, *ſp.* 1. *Octandria Monogynia*—Nat. ord.—*Veprecula.*
Mezereon, or ſpurge laurel.

Off.—Radix, ejuſque cortex. The bark of the root.

Mezereon is a ſhrub which grows in woody ſituations in the northern parts of Europe, and is admitted into our gardens from its flowering in winter. The bark, which is taken from the trunk, larger branches, and root, is thin, ſtriped reddiſh, commonly covered with a brown cuticle, has no ſmell, and when chewed, excites an inſupportable ſenſation of burning in the mouth and throat. When applied to the ſkin in its recent ſtate, or infuſed in vinegar, it raiſes bliſters.

Medical uſe.—The root was long uſed in the Liſbon diet-drink, for venereal complaints, particularly nodes and other ſymptoms reſiſting the uſe of mercury. The bark of the root contains moſt acrimony, though ſome prefer the woody part. Mezereon has alſo been uſed with good effects in tumours and cutaneous eruptions not venereal.

Dr. Cullen ſays that it acts upon the urine, ſometimes giving it a filamentous appearance, and upon the perſpiration, without diminiſhing the ſtrength remarkably; and that in irritable habits it quickens the pulſe, and increaſes the heat of the whole body. But Mr. Pearſon of the Lock hoſpital ſays, that excepting a caſe or two of lepra, in which a decoction of this plant conferred temporary benefit, he very ſeldom found it poſſeſſed of medicinal virtues, either in ſyphilis, or in the ſequelæ of that diſeaſe. In ſcrofula, or in cutaneous affections, it is employed chiefly under the form of decoction; but it has alſo been uſed in powder; and as it is apt to occaſion vomiting and purging, it muſt be begun in grain-doſes, and gradually increaſed. It is often combined with mercury.

The berries are ſtill more acrid than the bark, and they have even been known to produce fatal effects on children, who have been tempted by their beauty to eat them. It is ſaid that they are ſometimes infuſed in vinegar, to make it more pungent, and appear ſtronger.

Off. prep.—Decoct. *Ed.* Decoct. ſarſ. comp. *Lond. Dub.*

DATURA STRAMONIUM. *Ed. Stramonium officinale.*
Willd. g. 377, *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*
Thorn-apple.
Off.—Herba. The plant.

THE thorn-apple is an annual plant, a native of America, but now growing wild on dry hills and uncultivated places in England and other parts of Europe. The leaves are dark green, ſeſſile, large, egg-ſhaped, pointed, angular, and deeply indented, of a diſagreeable ſmell and nauſeous taſte. Every part of the plant is a ſtrong narcotic poiſon, producing vertigo, torpor, death. The beſt antidote to its effects is ſaid to be vinegar.

Medical uſe.—Dr. Störk firſt tried it as a remedy in mania and melancholy with conſiderable ſucceſs. Several caſes of the ſame diſeaſes were alſo cured or relieved by it, under the direction of different Swediſh phyſicians; and although in other experiments it frequently failed, it deſerves the attention of practitioners, and well merits a trial, in affections often incurable by other means. It has alſo been employed, and ſometimes with advantage, in epilepſy. An ointment prepared from the leaves has been ſaid to give eaſe in external inflammations and hæmorrhoids. The inſpiſſated juice of the leaves has been commonly uſed, but its exhibition requires the greateſt caution. At firſt, one fourth of a grain is a ſufficient doſe. The powder of the leaves or ſeeds promiſes to furniſh a more uniform and convenient formula than the inſpiſſated juice; and the bruiſed leaves, according to Plenk, ſoften hard and inflamed tumours, and diſcuſs tumours in the breaſts of nurſes from indurated milk.

Hufeland gave it in the form of a tincture, prepared of two ounces of the ſeeds in four ounces of wine and one of diluted alcohol, in diſeaſes of the mind.

DAUCUS CAROTA. *Semen. Ed. Daucus ſylveſtris. Lond. Dub.*
Willd. g. 530, *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*
Wild Carrot.
Off.—Semen. The ſeed.

THIS is a biennial plant, which grows wild in Britain, and is cultivated in great quantities as an article of food. The ſeeds, eſpecially of the wild variety, have a moderately warm pungent taſte, and an agreeable aromatic ſmell. They are carminative, and are ſaid to be diuretic. The roots, eſpecially of the cultivated variety, contain much mucilaginous and ſaccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to carcinomatous and ill-conditioned ulcers, allaying the pain, checking the ſuppuration and fetid ſmell, and ſoftening the callous edges.

DELPHINIUM STAPHISAGRIA. *Staphiſagria. Lond. Dub.*

Willd. g. 1061, *ſp.* 13. *Polyandria Trigynia.*—Nat. ord. *Multiſiliquæ.*

Staveſacre.

Off.—Semen. The ſeed.

STAVESACRE is a biennial plant, a native of the ſouth of Europe. The ſeeds are uſually brought from Italy. They are large and rough, of an irregular triangular figure, of a blackiſh colour on the outſide, and yellowiſh or whitiſh within; they have a diſagreeable ſmell, and a very nauſeous, bitteriſh, burning taſte.

Newmann got from 480 parts, 45 alcoholic extract, beſides 90 of fixed oil, which ſeparated during the proceſs, and afterwards 44 inſipid watery, and inverſely 95 watery, and then by alcohol only one, beſides 71 of oil.

Medical uſe.—Staveſacre was employed by the ancients as a cathartic; but it operates with ſo much violence, both upwards and downwards, that its internal uſe has been, among the generality of practitioners, for ſome time laid aſide. It is chiefly employed in external applications for ſome kinds of cutaneous eruptions, and for deſtroying lice and other inſects; inſomuch, that from this virtue it has received its name, in different languages.

DIANTHUS CARYOPHYLLUS. *Ed. Caryophyllum rubrum. Lond. Dub.*

Willd. g. 893, *ſp.* 9. *Decandria Digynia.*—Nat. ord. *Caryophylleæ.*

Clove Gilly-flower.

Off.—Flos. The flowers.

THIS ſpecies of dianthus is a native of Italy, and is perennial. By cultivation, its varieties have increaſed to a very great number, and they form one of the greateſt ornaments of our gardens. Moſt of theſe are termed Carnations; but the variety which is officinal ſurpaſſes all the others in the richneſs of its ſmell, and is alſo diſtinguiſhed by its colour, being of an uniform deep crimſon. Their only uſe in pharmacy is to give a pleaſant flavour and beautiful colour to an officinal ſyrup.

Off. prep.—Syr. dianthi caryophyll. *Ed. Lond.*

DIGITALIS PURPUREA. *Ed. Digitalis. Lond. Dub.*

Willd. g. 1155, *ſp.* 1. *Didynamia Angioſpermia.*—Nat. ord. *Solanaceæ.*

Foxglove.

Off.—Folium. The leaves.

THIS is an indigenous biennial plant, very common on hedge-banks, and ſides of hills, in dry, gravelly, or ſandy ſoils, and the

beauty of its appearance has gained it a place in our gardens and ſhrubberies. The leaves are large, oblong, egg-ſhaped, ſoft, covered with hairs, and ſeratted. They have a bitter, very nauſeous taſte, with ſome acrimony.

Medical uſe.—Its effects when ſwallowed are,

1. To diminiſh the frequency of the pulſe.
2. To diminiſh the irritability of the ſyſtem.
3. To increaſe the action of the abſorbents.
4. To increaſe the diſcharge by urine.

In exceſſive doſes, it produces vomiting, purging, dimneſs of ſight, vertigo, delirium, hiccough, convulſions, collapſe, death. For theſe ſymptoms the beſt remedies are cordials and ſtimulants.

Internally, digitalis has been recommended,

1. In inflammatory diſeaſes, from its very remarkable power of diminiſhing the velocity of the circulation.

2. In active hæmorrhagies, in phthſis.

3. In ſome ſpaſmodic affections, as in ſpaſmodic aſthma, palpitation, &c.

4. In mania from effuſion on the brain.

5. In anaſarcous and dropſical effuſions.

6. In ſcrofulous tumours.

7. In aneuriſm of the aorta, and palpitation, we have ſeen it alleviate the moſt diſtreſſing ſymptoms.

Externally, it has been applied to ſcrofulous tumours.

It may be exhibited,

1. In ſubſtance, either by itſelf, or conjoined with ſome aromatic, or made into pills with ſoap or gum ammoniac. Withering directs the leaves to be gathered after the flowering ſtem has ſhot up, and about the time when the bloſſoms are coming forth. He rejects the leaf-ſtalk, and middle rib of the leaves, and dries the remaining part either in the ſunſhine or before the fire. In this ſtate they are eaſily reduced to a beautiful green powder, of which we may give at firſt one grain twice a-day, and gradually increaſe the doſe until it act upon the kidneys, ſtomach, pulſe, and bowels, when its uſe muſt be laid aſide or ſuſpended.

2. In infuſion. The ſame author directs a drachm of the dried leaves to be infuſed for four hours in eight ounces of boiling water, and an ounce of any ſpiritous water to be added to the ſtrained liquor, for its preſervation. Half an ounce or an ounce of this infuſion may be given twice a-day.

3. In decoction. Darwin directs that four ounces of the freſh leaves be boiled from two pounds of water to one, and that half an

ounce of the ſtrained decoction be taken every two hours, for four or more doſes.

4. In tincture. Put one ounce of the dried leaves coarſely powdered into four ounces of diluted alcohol; let the mixture ſtand by the fire-ſide twenty-four hours, frequently ſhaking the bottle; and the ſaturated tincture, as Darwin calls it, muſt then be ſeparated from the reſiduum by ſtraining or decantation. Twenty drops of this tincture may be taken twice or thrice a-day. The Edinburgh college uſe eight ounces of diluted alcohol to one of the powder, but let it digeſt ſeven days.

5. The expreſſed juice and extract are not proper forms of exhibiting this very active remedy.

When the digitalis is diſpoſed to excite looſeneſs, opium may be advantageouſly conjoined with it; and when the bowels are tardy, jalap may be given at the ſame time, without interfering with its diuretic effects. During its operation in this way, the patient ſhould drink very freely.

Off. prep.—Inf. digit. *Ed.* Tinct. digit. *Ed.*

DOLICHOS PRURIENS. *Ed.* *Dolichos.* *Dub.*

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Cow-itch.

Off.—Pubes leguminis rigida. The ſtiff hairs which cover the pods.

The dolichos is a climbing plant growing in great abundance in warm climates, particularly in the Weſt Indies. The pods are about four inches long, round, and as thick as a man's finger. On the outſide they are thickly beſet with ſtiff brown hairs, which, when applied to the ſkin, occaſion a moſt intolerable itching.

Med. uſe.—The ripe pods are dipped in ſyrup, which is again ſcraped off with the knife. When the ſyrup is rendered by the hairs as thick as honey, it is fit for uſe. It acts mechanically as an anthelmintic, occaſions no uneaſineſs in the primæ viæ, which are defended by mucus, and may be ſafely taken, from a tea-ſpoonful to a table-ſpoonful in the morning, faſting. The worms are ſaid to appear with the ſecond or third doſe; and by means of a purge in ſome caſes, the ſtools have conſiſted entirely of worms.

DORSTENIA CONTRAJERVA. *Ed.* *Contrayerva.* *Lond.* *Dub.*

Willd. g. 244, *ſp.* 5. *Tetrandria Monogynia.*—Nat. ord. *Scabridæ.*

Contrayerva.

Off.—Radix. The root.

This plant is perennial, and grows in South America, and ſome of the Caribæan iſlands.

The root is knotty, an inch or two long, and about half an

inch thick, of a reddifh brown colour externally, and pale within: long, rough, flender fibres fhoot out from all fides of it; and are generally loaded with fmall round knots. It has a peculiar kind of aromatic fmell, and a fomewhat aftringent, warm, bitterifh tafte, with a light and fweetifh kind of acrimony, when long chewed: the fibres have little tafte or fmell; the tuberous part, therefore, fhould be alone chofen.

This root contains fo much mucilage, that a decoction of it will not pafs through the filter. Neumann got from 480 parts, 190 watery extract, and afterwards with alcohol 7, and inverfely 102 alcoholic, and 60 watery. I find that the tincture reddens infufion of lithmus, is precipitated by water, and has no effect on the falts of iron.

Med. ufe.—Contrayerva is a gentle ftimulant and diaphoretic, and is fometimes given in exanthematous difeafes, typhus, and dyfentery. Its dofe is about half a drachm.

Off. prep.—Pulv. contrayerv. comp. *Lond.*

ERYNGIUM MARITIMUM. *Eryngium. Lond. Dub.*

Willd. g. 518, *fp.* 6. *Pentandria Menogynia.*—Nat. ord. *Umbellatæ.*

Eryngo.

Off.—Radix. The root.

This plant grows plentifully on fome of our fandy and gravelly fhores: the roots are flender, and very long; of a pleafant fweetifh tafte, which, on chewing them for fome time, is followed by a light degree of aromatic warmth and acrimony. They are accounted aperient and diuretic, and have alfo been celebrated as aphrodifiac; their virtues, however, are too weak to admit them under the head of medicines.

EUGENIA CARYOPHYLLATA. *Caryophyllus Aromaticus, Ed. Caryophylla aromatica. Dub. Caryophyllus aromatica. Lond.*

Willd. g. 972 *fp.* 24. *Icofandria Monogynia.*—Nat. ord. *Hefperideæ.*

The clove tree.

Off.—Floris germen, et oleum ejus volatile. The flower-bud and its effential oil.

This is a beautiful tall tree, a native of the Molucca iflands. The Dutch, from a defire of monopolizing the valuable fpice produced by it, deftroyed all the trees except in Amboyna, where it is carefully cultivated. But their fcheme has been fruftrated, and the clove is now thriving in the Ifle of France and other places. Every part of this tree is highly aromatic, but efpecially the leaf-ftalk. Cloves are the flower-buds, which are gathered in October

and November, before they open, and when they are ſtill green, and are dried in the ſun, after having been expoſed to ſmoke for ſome days.

Cloves have ſomewhat the form of a nail, conſiſting of a globular head, formed of the four petals of the corolla, and four leaves of the calyx not yet expanded; but this part is often wanting, being eaſily broken off; and a germen ſituated below, nearly round, but ſomewhat narrower towards the bottom, ſcarcely an inch in length, and covered with another thicker calyx, divided above into four parts. Their colour ſhould be of a deep brown, their ſmell ſtrong, peculiar, and grateful; their taſte acrid, aromatic, and permanent. The beſt cloves are alſo large, heavy, brittle, and when preſſed with the nail, exude a little oil. When light, ſoft, wrinkled, dirty, pale, and without ſmell or taſte, they are to be rejected.

The Dutch, from whom we have this ſpice, frequently mix it with cloves from which the oil has been diſtilled. Theſe, though in time they regain from the others a conſiderable ſhare both of taſte and ſmell, are eaſily diſtinguiſhable by their weaker flavour and lighter colour.

Cloves yield by diſtilation with water about one ſeventh of their weight of volatile oil; 960 parts alſo gave to Neumann 380 of a nauſeous, ſomewhat aſtringent, watery extract. The ſame quantity gave only 300 of exceſſively fiery alcoholic extract. When the alcoholic extract is freed from the volatile oil by diſtillation with water, the oil that ariſes proves mild, and the reſin that remains inſipid. Its pungency therefore ſeems to depend on the combination of theſe principles. The Dutch oil of cloves is extremely hot and fiery, and of a reddiſh brown colour, but it is greatly adulterated, both with fixed oils and reſin of cloves; for the genuine oil when recently diſtilled, is comparatively quite mild, and colourleſs, although it gradually acquires a yellow colour. It is heavier than water, and riſes in diſtillation with ſome difficulty, ſo that it is proper to uſe a very low headed ſtill, and to return the diſtilled water ſeveral times upon the reſiduum.

Medical uſe—Cloves, conſidered as medicines, are very hot ſtimulating aromatics, and poſſeſs in an eminent degree the general virtues of ſubſtances of this claſs.

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Spt. ammon. comp. *Lond.* Confect. arom. *Lond.* Elect. ſcammon. *Lond. Dub.* Pil. aloes cum col. *Ed.*

FERRUM.

Iron is the moſt common of all metals. It ſeems even to be a conſtituent of organic ſubſtances, and is the only metal which, when taken into the body, exerts no deleterious action upon it.

The numerous ores of it which are found in every part of the globe, may be reduced to the following genera.

1. Native iron. Immenſe iſolated maſſes of this have been found in Siberia and in South America. Their origin is ſtill perfectly problematical.
2. Carburetted iron. Plumbago.
3. Sulphuretted iron. Pyrites.
4. Oxidized iron.

a. Protoxide. Magnetic iron ore; colour black or grey.
b. Peroxide. Not magnetic; colour red or brown.
c. Carbonated.
d. Arſeniated.
e. Tungſtated.

The properties of iron, when obtained from any of theſe ores by the uſual proceſſes of fuſion, &c. have been already deſcribed. As its mechanical diviſion is extremely difficult, it is directed to to be kept in the ſhops in the ſtate of filings or wire, and the ſcales of black oxide, which are found around the ſmith's anvil. Soft maleable iron is the only kind fit for internal uſe, as ſteel and caſt-iron always contain impurities, and often arſenic.

Medical uſe—The general virtues of this metal, and the ſeveral preparations of it, are, to conſtringe the fibres, to quicken the circulation, to promote the deficient ſecretions in the remoter parts, and at the ſame time to repreſs inordinate diſcharges into the inteſtinal tube. After the uſe of them, if they take effect, the pulſe is very ſenſibly raiſed; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increaſed. Fetid eructations, and the fæces voided of a black colour, are marks of their taking due effect.

When given improperly, or to exceſs, iron produces headach, anxiety, heats the body, and often cauſes hæmorrhagies, or even vomiting, pains in the ſtomach, and ſpaſms and pains of the bowels.

Iron is given in moſt caſes of debility and relaxation.

1. In paſſive hæmorrhagies.
2. In dyſpepſia, hyſteria, and chloroſis.
3. In moſt of the cachexiæ, and it has been lately recommended as ſpecific in cancer.
4. In general debility produced by diſeaſe, or exceſſive hæmorrhage.

Where either a preternatural diſcharge, or ſuppreſſion of natural ſecretions, proceed from a languor and ſluggiſhneſs of the fluids,

and weaknefs of the folids; this metal, by increafing the motion of the former, and the ftrength of the latter, will fupprefs the flux, or remove the fuppreffion; but where the circulation is already too quick, the folids too tenfe and rigid, where there is any ftricture or fpafmodic contraction of the veffels, iron, and all the preparations of it, will aggravate both diftempers.

Iron is prefcribed,

I. In its metallic ftate. *Limatura ferri.*
II. Oxidized.
 a. Protoxide. *Squamæ ferri. Ferri oxidum nigrum.*
  1. Super-carbonated, as in the chalybeate mineral waters.
  2. Sulphated. *Sulphas ferri.*
  3. Combined with tartrate of potafs. *Tartris ferri et potaffæ.*
 b. Peroxide. *Ferri oxidum rubrum.*
  1. Carbonated. *Carbonas ferri.*
  2. Muriated. *Murias ferri ferrugineus.*
  3. Combined with muriate of ammonia. *Murias ammoniæ et ferri.*

FERRUM. *Lond. Ferri limaturæ. Ed. Ferrum in fila ductum. Dub.*

Iron. Iron-filings. Iron-wire.

IRON probably has no action on the body when taken into the ftomach, unlefs it be oxidized. But during its oxidizement, hydrogen gas is evolved; and accordingly we find that fetid eructations are confidered as a proof of the medicine having taken effect. It can only be exhibited internally in the ftate of filings, which may be given in dofes of from five to twenty grains, either in the form of powder, with fome aromatic, or made into an electuary or bolus or pills with any bitter extract. Iron-wire is to be preferred for pharmaceutical preparations, both becaufe it is the moft convenient form, and becaufe it is always made of the pureft iron.

Off. prep.—Ferri limatura purificata, *Ed.* Carbonas ferri, *Ed. Lond. Dub.* Aqua ferri aërati, *Dub.* Sulphas ferri, *Ed. Lond. Dub.* Tinctura ferri muriati, *Dub.* Ferrum ammoniacale, *Lond.* Ferrum tartarifatum, *Lond.* Vinum ferri, *Lond. Dub.* Hydrarg. purif. *Lond. Ed.*

FERRI OXIDUM NIGRUM. *Ferri fquamæ. Ed.*

The fcales of iron.

WHEN iron is heated to rednefs in the fmith's forge, to render it more malleable, its furface becomes oxidized by the action of

the atmoſpheric air; and as the oxide formed does not adhere to the iron, it is eaſily ſeparated by percuſſion on the anvil, and flies off in the ſtate of ſparks, which, on cooling, conſtitute the ſcales of iron. In theſe the iron is oxidized to that degree in which it is ſoluble in acids, without the production of hydrogen gas; therefore, when taken into the ſtomach, they do not produce the diſtention and flatulence occaſioned by the uſe of the filings.

Off. prep.—Ferri oxidum nigrum purificatum, *Ed.* Tinctura muriatis ferri, *Ed.*

SULPHAS FERRI. *Ferrum vitriolatum. Dub.*

Sulphate of iron. Green vitriol. Copperas.

THE ſulphate of iron of commerce is commonly obtained by the ſpontaneous oxidizement of ſulphuretted iron, and ſubſequent lixiviation and cryſtallization. It is never pure, and often contains zinc or copper. The copper may be ſeparated by adding ſome metallic iron to the ſolution; but we have no means of ſeparating the zinc; therefore we muſt prepare it by diſſolving iron in diluted ſulphuric acid, in order to obtain it in a ſtate of purity. Its cryſtals are tranſparent rhomboidal priſms, of a fine green colour. They are ſoluble in two parts of cold, and in leſs than their own weight of boiling water. They are inſoluble in alcohol.

They are compoſed of

Black oxide of iron,	28	36 Green hydro-oxide of iron.
Water of compoſition,	8	
		26 Sulphuric acid.
		38 Water of cryſtallization.
		100

Green ſulphate of iron is decompoſed by all the earths and alkalies, and by thoſe ſalts whoſe baſe forms an inſoluble compound with ſulphuric acid. It is alſo decompoſed by expoſure to the air, eſpecially when in ſolution, and by all ſubſtances which part readily with their oxygen. The oxide of iron abſorbs oxygen, and paſſes to the ſtate of red oxide, which forms a red ſulphate, poſſeſſing properties very different from thoſe of the green ſulphate.

Taken into the ſtomach, the green ſulphate is apt to excite pain in the ſtomach, and ſpaſms in the bowels; and in large doſes it cauſes vomiting. In ſmall doſes, however, of from one to three grains, it is ſometimes given as a tonic, aſtringent, or anthelmintic.

Off. prep.—Acidum acetoſum forte, *Ed.* Carbonas ferræ præcip. *Ed.* Tinctura ferri acetati, *Dub.* Pulvis aloet. cum ferro, *Lond.*

FERULA ASSA FOETIDA. *Ed.* *Aſa Fœtida. Lond. Dub.* *Wild. g.* 539, *ſp.* 11. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Aſſa Fœtida.

Off.—Gummi-reſina. The gum-reſin.

THE plant which furniſhes aſſa fœtida is perennial, and a native of Perſia. It has, however, borne fertile ſeeds in the open air in the Botanical garden of Edinburgh. The gum-reſin is procured from the roots of plants which are at leaſt four years old. When the leaves begin to decay, the ſtalk is twiſted off, and the earth removed from about their large tapering roots. The top of the root is ſome time afterwards cut off tranſverſely; and forty-eight hours afterwards, the juice, which has exuded, is ſcraped off, and a ſecond tranſverſe ſection is made. This operation is repeated until the root be entirely exhauſted of juice. After being ſcraped off, the juice is expoſed to the ſun to harden.

It is brought to us in large irregular maſſes, compoſed of various little ſhining lumps or grains, which are partly of a whitiſh colour, partly reddiſh, and partly of a violet hue. Thoſe maſſes are accounted the beſt which are clear, of a pale reddiſh colour, and variegated with a great number of elegant white tears.

This drug has a ſtrong fetid ſmell, ſomewhat like that of garlic; and a bitter, acrid, biting taſte. It loſes ſome of its ſmell and ſtrength by keeping, a circumſtance to be particularly regarded in its exhibition.

Neumann got from 1920 parts, 1350 alcoholic extract, and afterwards 190 watery; and inverſely, 550 watery. The ſmell reſides entirely in an eſſential oil, which riſes in diſtillation both with alcohol and water. Neumann got more than 60 from 1920 grains.

Medical uſe.—It is the moſt powerful of all the fetid gums, and is a moſt valuable remedy. It acts as a ſtimulant, antiſpaſmodic, expectorant, emmenagogue, and anthelmintic. Its action is quick and penetrating.

It is often ſerviceable,

1. In croup.
2. In dyſpepſia, amenorrhœa, and chloroſis.
3. In aſthma, dyſpnœa, and hyſteria.
4. In tympanites and worms.

It is exhibited,

1. In ſubſtance, in the form of pills; in doſes of from five to twenty grains, either alone, or combined with bitter extracts or purgatives.

2. Diſſolved in ſome ſimple diſtilled water.
3. Diſſolved in alcohol.
4. In the form of clyſter, to the extent of about two drachms.

Off. prep.—Aſſa fœt. pur. *Lond.* Lac aſſæ fœtidæ, *Lond.* Tinctura, *Ed. Lond. Dub.* Tinct. caſt. comp. *Ed.* Spiritus ammon. fœtid. *Ed. Lond. Dub.* Pil. aloes cum aſſa fœt. *Ed.* Pil. aſſæ fœt. comp. *Ed.* Pil. galb. comp. *Lond.* Emp. aſſæ fœt *Lond.*

FICUS CARICA. *Ed.* *Carica. Lond. Dub.*
Polygamia Triœcia.—Nat. ord. *Scabridæ.*
The fig tree.
Off.—Fructus. The fruit.

THIS tree is probably a native of Aſia, but grows plentifully in the ſouth of Europe. As the fruit is very pulpy, it is dried when it is to be preſerved. To this country they are chiefly brought from the Levant. They conſiſt almoſt entirely of ſugar and mucilage, and are therefore demulcent. They alſo form a very convenient ſuppurating cataplaſm, either roaſted or boiled, and applied as hot as can be borne to parts where other cataplaſms cannot eaſily be kept applied.

Off. prep.—Decoct. hord. comp. *Lond.* Elect. ſennæ, *Ed. Lond.*

FRAXINUS ORNUS. *Ed. Lond. Dub.*
Polygamia Diœcia.—Nat. ord. *Aſcryoideæ.*
Manna-aſh.
Off.—Succus concretus *Manna* dictus. The concrete juice. Manna.

MANNA is obtained from other ſpecies of fraxinus beſides the ornus, and eſpecially from the rotundifolia. It is principally collected in Calabria, Apulia, and Sicily. In the warmeſt ſeaſon of the year, from the middle of June to the end of July, a clear juice exudes from the ſtem and branches of theſe trees, which, when naturally concreted on the plants and ſcraped off, is called Manna in the tear; but if allowed to exude on ſtraws, or chips of wood faſtened to the tree, it is called Canulated or flaky manna. The common, or fat manna, is got by inciſions made after the ſpontaneous exudation is over, and is in larger maſſes, and of a redder colour. The beſt Calabrian manna is in oblong, light, friable pieces or flakes, of a whitiſh or pale yellow colour, and ſomewhat tranſparent. The inferior kinds are moiſt, unctuous, and dark coloured. Manna is ſaid to be ſometimes counterfeited by a compoſition of ſugar and honey, mixed with a little ſcam-

mony: there is alſo a factitious manna, which is white and dry, ſaid to be compoſed of ſugar, manna, and ſome purgative ingredient, boiled to a proper conſiſtence. This may be diſtinguiſhed by its weight, ſolidity, untranſparent whiteneſs, and by its taſte, which is different from that of manna.

According to Neumann, manna diſſolves in alcohol. On ſetting the ſolution in a digeſting heat, it gradually depoſites 5-8ths of the manna, of a fine white colour, light, ſpongy, and in ſome degree cryſtalline, melting inſtantly upon the tongue, and impreſſing an agreeable ſweet taſte, without any of the nauſeouſneſs of the manna. By further evaporation 1-4th more is obtained ſimilar to manna; and on continuing the evaporation, a thick extract is formed, of the conſiſtence of a balſam, which can ſcarcely be fully exſiccated, but continues moiſt, and reſembles civet grown brown by age. In this extract, which is about one eighth, reſides all the nauſeous matter of the manna. It has indeed a degree of ſweetiſh taſte, but blended with a diſguſtful. The experiments which I have made verify theſe obſervations. The quantity of matter which a hot alcoholic ſolution of manna depoſites on cooling is various: a ſaturated ſolution concretes into a perfectly dry, white, ſpongy, cryſtallized maſs. When much leſs concentrated, it depoſites a congeries of moſt beautiful ſnow white acicular cryſtals. A ſaturated ſolution in boiling water alſo forms a ſolid cryſtallized maſs on cooling. It is therefore evident that manna cannot be a ſpecies of ſarcocoll, the only chemical difference between which and ſugar, ſtated by Dr. Thomſon, is its want of cryſtallizability.

Medical uſe.—Manna is a mild agreeable laxative, and may be given with ſafety to children and pregnant women: nevertheleſs, in ſome particular conſtitutions, it acts very unkindly, producing flatulency, and diſtenſion of the viſcera: theſe inconveniencies may be prevented by the addition of any grateful warm aromatic. Manna operates ſo weakly as not to produce the full effect of a cathartic, unleſs taken in large doſes; and hence it is rarely given with this intention by itſelf. It may be commodiouſly diſſolved in the purging mineral waters, or joined to the cathartic ſalts, ſenna, rhubarb, or the like.

Off. prep.—Syr. mannæ, *Dub.* Elect. caſſiæ, *Ed. Lond. Dub.*

FULIGO LIGNI COMBUSTI. *Dub.*

Wood-ſoot.

THIS ſubſtance is inflammable, of a ſhining black colour, a diſagreeable ſmell, and an empyreumatic, bitter, nauſeous taſte.

It varies ſomewhat according to the nature of the ſubſtance, and the ſtrength of the fire employed in its production. But it conſiſts principally of charcoal, empyreumatic oil, and acetous

acid. It ſometimes contains ammonia, and the other alkalies and earths. It medical properties are to be aſcribed ſolely to the empyreumatic oil it contains.

FUMARIA OFFICINALIS. *Fumaria. Dub.*
Diadelphia Hexandria.—Nat. ord. *Lomentaceæ.*
Common fumitory.
Off.—Herba. The plant.

THIS is a common annual weed, in ſhady cultivated grounds. It is very juicy, of a bitter taſte, without any remarkable ſmell. The alleged medical effects of this herb are, to ſtrengthen the tone of the bowels, gently looſen the belly, and promote the urinary and other natural ſecretions. It is principally recommended in melancholic, ſcorbutic, and cutaneous diſorders.

GENTIANA LUTEA. *Ed.* *Gentiana. Lond. Dub.*
Willd. g. 512, *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Rotaceæ.*
Gentian.
Off.—Radix. The root.

GENTIAN is a perennial plant, which grows upon the Alps, Pyrenees, Appenines, and other mountainous ſituations in the temperate parts of Europe.

The roots are long, thick, externally of a brown colour, and wrinkled: internally ſpongy, and of a yellow colour, without any remarkable ſmell, but ſurpaſſing in bitterneſs all other European vegetables. Alcohol diſſolves only the bitter extractive, water both the extractive and mucilage.

Neumann got from 960 grains 390 alcoholic, and afterwards 210 inſipid watery extract; and inverſely, 540 watery, and only 20 alcoholic.

Gentian poſſeſſes the general virtues of bitters in an eminent degree, and it is totally devoid of aſtringency. On dead animal matter it acts as an antiſeptic. Taken into the ſtomach, it proves a powerful tonic, and in large doſes it evacuates the inteſtines. It is uſeful in debility of the ſtomach, in general debility, and in gout. Combined with aſtringents, it cures intermittents. Externally, it is applied to putrid ulcers.

Off. prep.—Infuſ. g. comp. *Ed Lond. Dub.* Tinct. g. comp. *Ed. Lond.* Vin. g. comp. *Ed.* Extract. gent. *Ed. Lond. Dub.* Tinct. rhei cum gent. *Ed.*

GEOFFRÆA INERMIS. *Ed.* *Geoffroea. Dub.*
Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*
Cabbage-tree bark.
Off.—Cortex. The bark.

The bark of this tree, which grows in the low ſavannahs of Jamaica, is of a grey colour externally, but black and furrowed on the inſide. The powder looks like jalap, but is not ſo heavy. It has a mucilaginous and ſweetiſh taſte, and a diſagreeable ſmell. But its medical effects are much greater than its ſenſible qualities would lead us to expect.

When properly exhibited, it operates as a powerful anthelmintic, eſpecially in caſes of lumbrici. It is given in form of powder, decoction, ſyrup, and extract, but ſhould always be given in ſmall doſes. The decoction is preferred; and is made by ſlowly boiling an ounce of the freſh dried bark in a quart of water, till it aſſume the colour of Madeira wine. This ſweetened is the ſyrup; evaporated, it forms an extract. It commonly produces ſome ſickneſs and purging; ſometimes violent effects, as vomiting, delirium, and fever. Theſe laſt are ſaid to be owing to an over doſe, or to drinking cold water; and are relieved by the uſe of warm water, caſtor oil, or a vegetable acid.

Off. prep.—Decoct. *Ed.*

GLYCYRRHIZA GLABRA. *Ed.* *Glycyrrhiza. Lond. Dub.*
Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*
Liquorice.

Off.—Radix, extractum. The root and the extract.

Liquorice is a perennial plant, and a native of the ſouth of Europe, but it is cultivated in conſiderable quantities in England for medical purpoſes; and the roots which are raiſed in this country, are preferred to thoſe imported from abroad, which are very frequently mouldy and ſpoiled, which this root is extremely apt to be when not well preſerved in a perfectly dry place. The roots are very long, about an inch thick, flexible, fibrous, externally of a brown colour, internally yellow, and, when freſh, juicy. Their taſte is very ſweet, combined with a ſlight degree of bitter, when long kept in the mouth. They are prepared for uſe by peeling them, cutting away all the fibres and ſpoiled or mouldy parts.

The powder of liquorice uſually ſold is often mingled with flour, and perhaps alſo with ſubſtances not quite ſo wholeſome. The beſt ſort is of a browniſh yellow colour, the fine pale yellow being generally ſophiſticated, and it is of a very rich ſweet taſte, much more agreeable than that of the freſh root.

Neumann got from 960 parts of dried liquorice, 300 alcoholic extract, and afterwards 210 watery; and inverſely, 540 watery, and only 30 alcoholic. The original alcoholic extract is the ſweeteſt.

Medical uſe.—Its predominent conſtituents being ſaccharine and mucilaginous matter, its only action is that of a mild demulcent, and as ſuch it is frequently uſed in catarrh, and in ſome ſto-

mach complaints, which ſeem to ariſe from a deficiency of the natural mucus, which ſhould defend the ſtomach againſt the acrimony of the food, and the fluids ſecreted into it.

On account of its bulk it is rarely exhibited in ſubſtance, but more frequently in infuſion or decoction.

Off. prep.—Extract. glyc. *Ed. Lond. Dub.* Decoct. daph. mezer. *Ed.* Decoct. guaiaci comp. *Ed.* Decoct. hord. comp. *Lond.* Decoct. ſarſ. comp. *Lond. Dub.* Elect. ſennæ, *Lond. Ed.* Trochiſci amyli, *Lond.* Tinct. rhab. comp. *Lond.* Pil. hydrarg. *Lond. Dub.*

Extractum Glycyrrhizæ Glabræ. *Ed.*

Extract of liquorice.

As this extract is never prepared by the apothecary, but commonly imported from other countries, the Edinburgh college have inſerted it in their liſt of materia medica. It is imported in cylindrical rolls, covered with bay leaves. It ſhould be perfectly black, brittle when cold, and break with a ſmooth and glaſſy fracture, have a ſweet taſte, without empyreuma, and be entirely ſoluble in water. It is prepared from the freſh roots by expreſſion, decoction, and inſpiſſation.

The beſt foreign extract of liquorice is prepared in Catalonia, but it is not ſo pure or ſo agreeable as the refined liquorice ſold in the ſhops, in ſmall cylindrical pieces, not thicker than a gooſe-quill.

Neumann got from 480 parts of Spaniſh extract 460 watery extract, and the reſiduum was not affected by alcohol; and inverſely, he got 280 alcoholic, and 180 watery extract. In this laſt caſe the alcoholic extract contained all the ſweetneſs, the watery having ſcarcely any taſte. From the ſimilarity of their taſte, Dr. Thomſon has made it a ſpecies of his new genus ſarcocoll, but Neumann's more accurate analyſis ſhews that it is a compound.

The extract poſſeſſes the ſame properties with the root, and is uſed for the formation of ſeveral kinds of troches.

Off. prep.—Tinctura aloes, *Ed. Dub. Lond.* Trochiſci, *Lond. Dub. Ed.* Trochiſci cum opio, *Ed. Dub.*

GRATIOLA OFFICINALIS. *Ed.* *Gratiola. Lond.*

Willd. g. 49, *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Perſonatæ.*

Hedge-hyſſop.

Off.—Herba. The plant.

This is a perennial plant, a native of marſhy ſituations in the ſouth of Europe. It is gathered for uſe when in flower. It has no ſmell, but a very bitter, ſomewhat nauſeous taſte. It is a draſ-

tic purgative and emetic, and a very powerful anthelmintic, but its ufe requires caution. In fubftance it may be given to the extent of half a drachm, and in infufion to three drachms.

GUAJACUM OFFICINALE. *Ed.* *Guaiacum. Lond. Dub. Willd. g.* 819, *fp.* 2. *Decandria Monogynia.*—Nat. ord. *Gruinales.*

Guaiac.

Off.—Lignum, cortex, refina. The wood, bark, and refin.

THIS tree is a native of the Weft Indies, where it grows to a middling fize. The wood is heavier than water, very hard, refinous, and of a greenifh-black colour. Its tafte is bitterifh, and when kindled it gives out a pleafant fmell. It is brought either in pieces, which are fometimes covered with a pale yellow alburnum, or already rafped, when by divifion its colour appears greenifh brown, or yellow. The bark is thin, of an afh-grey, or blackifh colour, and apparently compofed of feveral laminæ. It is lefs refinous than the wood. Neumann got from 7680 parts of the wood 1680 alcoholic, and 280 watery extract; and inverfely, 740 watery, and 960 alcoholic. From 3840 of the bark he got 560 alcoholic, and 320 watery; and inverfely, 620 watery, and 240 alcoholic. The refin exudes fpontaneoufly in tears, but is principally obtained by fawing the wood into billets about three feet long, which are then bored with an augre longitudinally. One end of thefe is laid upon a fire, fo that a calabafh may receive the melted refin, which runs through the hole as the wood burns. It may be alfo obtained by boiling the chips or fawings of the wood in water and muriate of foda. The refin fwims at the top, and may be fkimmed off.

This refin has a brownifh yellow colour externally; when held againft the light is tranfparent, breaks with a uniform fmooth fhining fracture, of a bluifh-green colour, pulverizable, powder of a white colour, gradually becoming bluifh-green, fufible in a moderate heat, but not foftened by the heat of the fingers, foluble in alcohol, infoluble in water, (Neumann got from 480 parts 400 alcoholic, and only 10 watery extract; and inverfely, 80 watery, and 280 alcoholic), without proper fmell or tafte, but when thrown on hot coals diffufing an agreeable odour, and when fwallowed in a ftate of minute divifion, caufing an infufferable burning and prickling in the throat. It therefore is not a gummy refin, but a pure refin. It is fometimes adulterated with colophony or common refin, but the fraud is eafily detected by the fmell of turpentine which they emit when thrown on live coals. Dr. Woolafton has difcovered a curious property of guaiac. By expofure to air and light, it ac-

quires a green colour. This effect is produced in the greatest degree by the most refrangible rays. In the least refrangible rays it is disoxydized, and the yellow colour is restored. The same effect is produced by hot metal.

Medical use.—Taken internally, guaiac commonly excites a sense of warmth in the stomach, a dryness of the mouth, with thirst. It increases the heat of the body, and quickens the circulation. If the patient be kept warm, it produces diaphoresis; if exposed freely to the air, an increased flow of urine. In large doses it is purgative.

Guaiac is a useful remedy,

1. In rheumatism and gout.
2. In certain venereal symptoms; as in foul indolent ulcers, and a thickened state of the ligaments or periosteum, remaining after the body is reduced by a mercurial course. Guaiac will also suspend the progress of some of the secondary symptoms; but it is totally incapable of eradicating the disease.
3. In cutaneous diseases.
4. In ozæna, and scrofulous affections of the membranes and ligaments.

The wood is always exhibited in decoction. From the resinous nature of the active constituent of this substance, this cannot be a very active preparation, as the menstruum is totally incapable of dissolving, though it may suspend a little of the resin. The decoction of an ounce may be drunk in cupfuls in the course of a day.

The resin may be exhibited,

1. In substance, either made into pills, or suspended in water in the form of an emulsion. In this way from 10 to 30 grains of the resin may be taken in the day.
2. In solution; in alcohol. About half an ounce of the tincture, with three ounces of water, is a sudorific dose for an adult, if he attend to keeping himself warm.
3. Combined with an alkali.

Off. prep.—Tinct. *Ed.* Tinct. guaic. ammon. *Ed. Lond. Dub.* Pulv. aloet. cum guaic. *Lond.* Decoct. comp. *Ed.* Decoct. sarf. comp. *Lond. Dub.*

HÆMATOXYLON CAMPECHIANUM. *Ed.* *Hæmatoxylum. Lond. Dub.*

Willd. g. 830, *sp.* 10. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Logwood.

Off.—Lignum, vulgo Lignum Campechenſe. The wood.

THIS tree was introduced from the Honduras into Jamaica, where it is now very common. The wood is firm, heavy, and of a dark red colour. Its taſte is ſweet, with a ſlight degree of aſtringency. It forms a precipitate with ſolution of gelatine, very readily ſoluble in exceſs of gelatine, and with ſulphate of iron it ſtrikes a brighter blue than any other aſtringent I have tried. It is uſed principally as a dye-wood, but alſo with conſiderable advantage in medicine.

Its extract is alſo ſweet and ſlightly aſtringent; and is therefore uſeful in obſtinate diarrhœas, and in chronic dyſentery.

HELLEBORUS.

Willd. g. 1089. *Polyandria Polygynia.*—Nat. ord. *Multiſiliquæ.*

Sp. 2. HELLEBORUS NIGER. *Ed. Lond. Dub.* *Melampodium.* Black Hellebore.

Off.—Radix. The root.

THIS plant is perennial, and grows wild in the mountainous parts of Auſtria, and on the Pyrenees and Appenines. The earlineſs of its flowers, which ſometimes appear in December, has gained it a place in our gardens.

The roots conſiſt of a black furrowed roundiſh head, about the ſize of a nutmeg, from which ſhort articulated branches ariſe, ſending out numerous corrugated fibres, about the thickneſs of a ſtraw, from a ſpan to a foot in length, deep brown on the outſide, white, or yellowiſh-white within, and of an acrid, nauſeous, and bitteriſh taſte, exciting a ſenſe of heat and numbneſs in the tongue, and of a nauſeous acrid ſmell. Theſe fibres only are uſed in medicine, and the head and decayed parts are rejected. For the roots of the real black hellebore, the roots of the Adonis vernalis, Trollius Europæus, Actæa ſpicata, Aſtrantia major, Helleboris viridis fœtidus, Veratrum album, and Aconitum neomontanum, are often ſubſtituted. The laſt is a moſt virulent poiſon, and may be diſtinguiſhed by its roots being fuſiform, or nearly globular, ſending out numerous very brittle fibres, of a greyiſh black or brown colour, as thick as a man's finger, and repeatedly divided. But the ſureſt way to avoid miſtakes, is by the apothecary cultivating the plant itſelf in his own garden.

Neumann got from 2880 grains 380 alcoholic, and 181 watery extract; and inverſely, 362 watery and 181 alcoholic. Its active conſtituent ſeems to be of a volatile nature; for it loſes its virtues by keeping, and water diſtilled from it has an acrid taſte.

Medical uſe.—In large doſes, hellebore is a draſtic purgative; in ſmaller doſes, it is diuretic and emmenagogue. It is princi-

pally uſed as a purgative in caſes of mania, melancholy, coma, dropſy, worms and pſora, and as an emenagogue. But its uſe requires very great caution, for its effects are very uncertain, and affected by many circumſtances.

It is commonly exhibited in the form of extract, although its activity be much diſſipated by the preparation. An infuſion or tincture certainly promiſe to be medicines of more uniform powers. Willdenow ſays, that the black hellebore of the ancients is his fifth ſpecies, the Helleborus orientalis.

Off. prep.—Tinct. *Lond. Dub. Ed.*

Sp. 6. HELLEBORUS FOETIDUS. *Helleboraſter. Lond.*

Bears-foot.

Off.—Folium. The leaves.

THIS ſpecies is native of England. It is perennial, and grows in ſhady places, and under hedges. The leaves have an acrid, bitter, nauſeous taſte, and unpleaſant ſmell, eſpecially when they are freſh. When dried, they are frequently given as a domeſtic medicine to deſtroy worms; but they muſt be uſed ſparingly, being ſo violent in their operation, that inſtances of their fatal effects are recorded.

HORDEUM DISTICHON. *Ed. Dub.* *Hordeum. Lond.*

Willd. g. 151, *ſp* 3. *Triandria Digynia.*—Nat. ord. *Gramina.*

Barley.

Off.—Semen omni cortice nudatum. The ſeed. Pearl barley.

BARLEY is an annual plant, cultivated in almoſt every country of Europe. Linnæus ſays, that it is a native of Tartary, but without adducing ſufficient proof.

Pearl barley is prepared by grinding off the huſk of rough barley, and forming the grain into little round granules, which appear of a kind of pearly whiteneſs. In this ſtate barley conſiſts almoſt ſolely of amylaceous matter, and when boiled forms an excellent article of nouriſhment; while a decoction of it, properly acidulated, is one of the beſt beverages in acute diſeaſes.

Off. prep.—Decoct. *Ed. Lond.*

HYDRARGYRUM. *Dub.* *Hydrargyrus. Lond. Ed.*

Mercury. Quickſilver.

THE general, chemical, and phyſical properties of this metal, have been already enumerated. We ſhall now treat of it more minutely, as forming an important article in the materia medica.

It is found,

I. In its metallic ſtate:
   a. Uncombined.
   b. Alloyed with ſilver.
   c. Alloyed with copper.
   d. Combined with ſulphur, (Cinnabar).
   e. Combined with hydroguretted ſulphur, (Æthiops minerale.)

II. Oxidized:
   a. Combined with muriatic acid.
   b. ———— ſulphuric acid.

There are conſiderable mines of mercury in Hungary and in Spain; and what is employed in England is principally imported from the former country.

Mercury taken into the ſtomach in its metallic ſtate has no action on the body, except what ariſes from its weight or bulk. It is not poiſonous, as was vulgarly ſuppoſed, but perfectly inert.

But in its various ſtates of combination, it produces certain ſenſible effects. It quickens the circulation, and increaſes all the ſecretions and excretions. According to circumſtances, the habit of the body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various: it ſometimes increaſes one ſecretion more particularly, ſometimes another, but its moſt characteriſtic effect is the increaſed flow of ſaliva, which it generally excites, if given in ſufficient quantity. Its particular effects, and means of producing each of them, will be noticed hereafter.

From many motives, both laudable and culpable, mercury has been tortured into a greater variety of forms than any other article of the materia medica. Of theſe, Swediaur has given a complete table, in the late edition of his works on the venereal diſeaſe. It is too long for inſertion in this place: we ſhall therefore give a ſyſtematic view of thoſe mercurial preparations only which enter at leaſt one of the Britiſh pharmacopœias.

Mercury is exhibited,

I. Purified by diſtillation.
   Hydrargyrum purificatum. Dub. Lond. Ed.

II. Oxidized:
   A. Protoxide.
      1. By precipitation from its ſolution in nitrous acid, by ammonia.

Oxidum hydrargyri cinereum. Ed.
Pulvis hydrargyri cinereus. Dub.
2. By trituration:
a. With unctuous substances.
Unguentum hydrargyri. Ed.
——————— fortius. Lond. Dub.
——————— mitius. Lond. Dub.
Emplastrum ammoniaci cum hydrargyro. Lond.
———— lithargyri cum hydrargyro. Lond.
———— hydrargyri. Ed.
b. With saccharine substances.
Pilulæ hydrargyri. Lond. Dub. Ed.
c. With carbonate of lime.
Hydrargyrus cum creta. Lond.

III. Oxidized:
B. Peroxide.
1. By the action of heat and air.
Hydrargyrum calcinatum. Lond. Dub.
2. By the action of nitrous acid.
Oxidum hydrarg. rubrum per acidum nitricum. Ed.
Hydrargyrum sub-nitratum. Dub.
Hydrargyrus nitratus ruber. Lond.
Unguentum oxidi hydrargyri rubri. Ed.

IV. Oxidized and combined with acids:
A. Protoxide.
1. With nitrous acid:
Unguentum nitratis hydrargyri. Lond. Dub. Ed.
2. With sulphuric acid:
Sub-sulphas hydrargyri flavus. Ed.
Hydrargyrum sub-vitriolatum. Dub.?
Hydrargyrus vitriolatus. Lond.
3. With muriatic acid:
a. By sublimation.
Sub-murias hydrargyri. Ed.
Hydrargyrum muriatum mite sublimatum. Dub.
Calomelas. Lond.
b. By precipitation.
Sub-murias hydrargyri præcipitatus. Ed.
Hydrarg. muriat. mite præc. Dub.
Hydrargyrus muriatis mitis. Lond.

4. With acetous acid:
Acetis Hydrargyri. Ed.
Hydrargyrum acetatum. Lond. Dub.

B. Peroxide.

1. Muriate.
Murias hydrargyri. Ed.
Hydrargyrus muriatus. Lond.
Hydrargyrum muriatum corrosivum. Dub.

2. Sub-muriate with ammonia.
Calx hydrargyri alba. Lond.

V. Combined with sulphur.

1. By trituration.
Sulphuretum hydrargyri nigrum. Ed.
Hydr. cum sulph. Lond.
Hydrargyrum sulphuratum nigrum. Dub.

2. By sublimation.
Hydrargyrum sulphuratum rubrum. Lond. Dub.

Mercury, or some of its preparations, is exhibited,

1. As an errhine. The sub-sulphate of mercury.
2. As a sialogogue. Mercury, in almost any form.
3. As a cathartic. The sub-muriate of mercury, (calomel).
4. As a diuretic. The oxides, the muriate, and the sub-muriate, combined with other diuretics.
5. As a sudorific. Calomel, conjoined with a sudorific regimen.
6. As an emmenagogue.
7. As an astringent. Muriate of mercury.
8. As a stimulant. Muriate of mercury.
9. As an antispasmodic.
10. As an anthelmintic.

With some of these views, mercury is frequently exhibited,

1. In febrile diseases; in obstinate agues.
2. In inflammatory diseases; in indolent and chronic inflammations, especially of the glandular viscera, as the liver, spleen, &c.
3. In exanthematous diseases; variola.
4. In profluvia; in dysentery.
5. In spasmodic diseases; tetanus, trismus, hydrophobia, &c.
6. In cachectic diseases; anasarca, ascites, hydrothorax, hydrocephalus, &c.
7. In impetigines; scrofula, syphilis, lepra, icterus, &c.

8. In local diſeaſes; in caligo corneæ, amauroſis, gonorrhæa, obſtipatio, amenorrhœa ſuppreſſionis, tumours of various kinds, herpes, tinea, pſora, &c.

Mercury occaſionally attacks the bowels, and cauſes violent purging, even of blood. This effect is remedied by intermitting the uſe of the medicine, and by exhibiting opium.

At other times it is ſuddenly determined to the mouth, and produces inflammation, ulceration, and an exceſſive flow of ſaliva. In this caſe, too, the uſe of the mercury muſt be diſcontinued for a time; while, according to Mr. Pearſon's advice, the patient ſhould be freely expoſed to a dry cold air, with the occaſional uſe of cathartics, Peruvian bark, and mineral acids, and the aſſiduous application of aſtringent gargles. On the other hand, the ſudden ſuppreſſion of ptyaliſm is not without danger. It is moſt frequently cauſed by cold liquids being taken into the ſtomach, or expoſure to cold and moiſture, while under the influence of mercury. The danger is to be obviated by the quick introduction of mercury, ſo as to affect the gums, with the occaſional uſe of the warm bath.

Sometimes alſo a morbid condition of the ſyſtem occurs during a mercurial courſe, and which tends to a fatal iſſue. Mr. Pearſon has termed it Erethiſmus. It is characterized by great depreſſion of ſtrength; a ſenſe of anxiety about the præcordia; frequent ſighing; trembling, partial or univerſal; a ſmall, quick pulſe; ſometimes vomiting; a pale contracted countenance; a ſenſe of coldneſs, while the tongue is ſeldom furred, or the vital or natural functions much diſordered. In this ſtate a ſudden or violent exertion of muſcular power will ſometimes prove fatal. To prevent dangerous conſequences, the mercury muſt be diſcontinued, whatever may be the ſtage, extent, or violence of the diſeaſe for which it has been exhibited, and the patient muſt expoſe himſelf freely to a dry and cool air, in ſuch a manner as ſhall be attended with the leaſt fatigue; and in the courſe of ten or fourteen days, he will ſometimes be ſo far recovered, that he may ſafely reſume the uſe of mercury.

HYOSCYAMUS NIGER. *Ed.* *Hyoſcyamus. Dub.* *Willd. g.* 378, *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

Black henbane.

Off.—Herba, ſemen. The herb and ſeeds.

HENBANE is a biennial plant, which grows in great abundance in moſt parts of Britain, by the road ſides, and among rubbiſh. Its ſmell is ſtrong and peculiar, and when bruiſed, ſomewhat like obacco, eſpecially when the leaves are burnt; and on burning

they ſparkle, as if they contained a nitrate; when chewed, however, they have no ſaline taſte, but are inſipid, mild, and mucilaginous. Henbane, in a moderate doſe, often produces ſweat, and ſometimes an eruption of puſtules, and generally ſound ſleep, ſucceeded by ſerenity of mind, and recruited vigour of the body: but, like the other narcotics, inſtead of theſe, it ſometimes gives riſe to vertigo, headach, and general uneaſineſs. With particular individuals, it occaſions vomiting, colic pains, a copious flow of urine, and ſometimes purging. In exceſſive doſes, its effects are fatal; general debility, delirium, remarkable dilatation of the pupils of the eyes, convulſions, death. Upon the whole, like opium, it is a powerful anodyne; and, like cicuta, it is free from any conſtipating effect, having rather a tendency to move the belly.

Med. uſe.—From the writings of Dioſcorides and others, it appears, that different ſpecies of Henbane have been long uſed in the practice of medicine. By Celſus it was applied externally as a collyrium in ophthalmia; for allaying the pain of the toothach; and he gave it internally as an anodyne.

Its uſe, however, was for a long period entirely relinquiſhed, until lately revived by Dr. Störk of Vienna; and it has been uſed both by him and by many other practitioners, in thoſe caſes where an anodyne is requiſite, and where there are objections to the uſe of opium. It is employed in wandering rheumatic pains, in indurations of the mammæ, from retained milk, painful ſwellings, whether ſcirrhous or not, ſcrofulous and cancerous ulcers, inflamed piles, and ſpaſms of the bowels from increaſed irritability; under the form of a cataplaſm, of the bruiſed leaves, with bread and milk; of an ointment, made with the powder of the leaves, with wax and oil; of a ſimple powder, ſprinkled on the ſore; or of a decoction in milk as an injection. An infuſion prepared by digeſting the bruiſed leaves in olive oil, is alſo uſefully applied in inflammation of the bowels, kidneys, teſticles, urethra, painful retention of urine, and in blind piles.

An extract from the leaves, or from the ſeeds, is the form in which it is given internally; and it has been uſed with advantage in a variety of nervous affections, as mania, melancholia, epilepſy, hyſteria, triſmus, and ſpaſms from injured nerves, in rheumatiſm and arthritis, in glandular ſwellings, in obſtinate ulcerations, and in every caſe where it is deſirable either to allay inordinate action, or to mitigate pain. Its doſe may be gradually increaſed from half a grain. Collin puſhed it to the length of 30 grains for a doſe.

Off. prep.—Succus ſpiſſat. *Ed.* Tinct. *Ed.*

HYPERICUM PERFORATUM. *Hypericum. Lond.*
Polyadelphia Polyandria.—Nat. ord. *Aſcyroideæ.*

Common St. John's wort.

Off.—Flos. The flower.

THIS pant is perennial, and grows wild in woods and uncultivated places in Britain. Its tafte is rough and bitterifh, and its fmell difagreeable. It abounds with veficles, containing a tranfparent matter, fo that when viewed, by holding the plant between the eye and the light, they refemble perforations. From the frefh flower buds, a red juice may be expreffed, which imparts its colour to alcohol, water, and fixed oils. The red colour of the infufion is brightened by acids, and is changed to black by fulphate of iron. Neumann got from 480 grains, 300 of watery, and 40 of alcoholic extract; and inverfely, 240 alcoholic and 120 watery. Nothing confiderable arofe in diftillation with either water or alcohol.

HYSSOPUS OFFICINALIS. *Ed.* *Hyffopus. Dub.*

Willd. g. 1096, *fp.* 1. *Didynamia Gymnofpermia.*—Nat. ord. *Verticillatæ.*

Hyffop.

Off.—Herba, folium. The herb and leaves.

HYSSOP is a perennial herb which grows wild in Germany.

The leaves of hyffop have an aromatic fmell, and a warm pungent tafte. Their virtues depend entirely on an effential oil which rifes in diftillation both with water and alcohol. Befides the general virtues of aromatics, they were formerly recommended in humoral afthmas, coughs, and other diforders of the breaft and lungs, and were faid to promote expectoration.

INULA HELENIUM. *Enula Campana. Dub. Lond.*

Willd. g. 1489, *fp.* 1. *Syngenefia Superflua.*—Nat. ord. *Compofitæ radiatæ.*

Elecampane.

Off.—Radix. The root.

THIS is a very large downy perennial plant, fometimes found wild in moift rich foils. The root, efpecially when dry, has an agreeable aromatic fmell: its tafte, on firft chewing, is glutinous, and, as it were, fomewhat rancid; in a little time it difcovers an aromatic bitternefs, which by degrees becomes confiderably acrid and pungent.

Neumann got from 480 grains of the dry root 390 watery, and 5 alcoholic extract; and inverfely, 150 alcoholic, and 300 watery. In diftillation, alcohol elevated nothing, but the diftilled water was firft obferved by Geoffroy to be milky, and mixed with flocculi of a cineritious concrete volatile oil, partly fwimming, and partly finking in the water. He alfo afcertained that it was fufible, and compares it to camphor or benzoic acid. Neumann likewife examined

it, and conſiders it as a peculiar ſubſtance, having ſome reſemblance to camphor. He found that it melts with a gentle heat, and when cold, appears ſofter and more unctuous; that it never aſſumes a cryſtalline form, but when dry proves opaque and crumbly; that laid on burning coals it totally exhales; that it is ſoluble in alcohol, but inſoluble in water; and that by keeping it gradually loſes the ſmell of elecampane.

Medical uſe.—It is a gently ſtimulating medicine, nearly ſimilar in its action to angelica. The extract is merely a ſlight bitter, as the eſſential oil is totally diſſipated in the preparation.

IRIS.

Willd. g. 97. *Triandria Monogynia.*—Nat. ord. *Enſatæ.*

Sp. 7. IRIS FLORENTINA. *Ed. Iris. Lond.*

Florentine Orris.

Off.—Radix. The root.

THIS is a perennial plant, a native of the ſouth of Europe. The dried root is imported from Italy. It is white, flattiſh, knotty, and has a very ſlightly bitter taſte, and an agreeable ſmell, reſembling that of violets.

Neumann got from 480 parts, 77 alcoholic, and afterwards 100 watery extract, and inverſely 180 watery, and 8 alcoholic. The diſtilled water ſmells a little of the root, but exhibits no appearance of oil. It is chiefly uſed as a perfume.

Off. prep.—Troch. amyli, *Lond.*

Sp. 24. IRIS PSEUDACORUS. *Iris. Dub.*

Water-flag.

Off.—Radix. The root.

THIS plant is perennial, and grows in great abundance by the brinks of rivers, and in other watery places: the root has an acrid taſte; and when freſh, is ſtrongly cathartic.

Medical uſe.—The expreſſed juice, given to the quantity of ſixty or eighty drops every hour or two, and occaſionally increaſed, has been productive of very copious evacuations, after jalap, gamboge, and other ſtrong purgatives had proved ineffectual; and it is in this form only that it is uſed; for by drying, it entirely loſes its purgative effects.

We have here another proof of the neceſſity of denominating the officinal vegetables by their ſyſtematic names; for in England, *Radix Iridis* is a pleaſant perfume, in Ireland a draſtic purgative; and as conſultations are not unfrequently ſent from the one country to the other, ignorance of this circumſtance might give riſe to unpleaſant conſequences.

ISIS NOBILIS. *Corallium Rubrum. Lond.*

Red coral.

This is the axis of a zoophyte of the order of ceratophyta. It is found only in the Mediterranean ſea, and the ſentient fleſh is rubbed off by means of pumice-ſtone. The coral thus prepared is of a ſcarlet or pale red colour, and ſuſceptible of a high poliſh. As an article in medicine, it is to be regarded merely as an indurated carbonate of lime.

Off. prep.—Corall. ppt. *Lond.* Pulv. chel. cancri comp. *Lond.*

JUGLANS REGIA. *Juglans. Lond.*

Monoecia Polyandria.—Nat. ord. *Amentaceæ.*

The walnut-tree.

Off.—Fructus immaturus. The unripe fruit.

This beautiful tree, although a native of Perſia, grows to a very large ſize, and produces ripe fruit in moſt parts of England. The fruit conſiſts of a thick, fleſhy, green, ſmooth rind, which incloſes the proper nut. When unripe, they have a peculiar ſmell, and a bitteriſh aſtringent taſte.

Medical uſe.—They have been ſuppoſed to poſſeſs tonic and anthelmintic virtues. The green rind has been celebrated as a powerful anti-venereal remedy; but it poſſeſſes no real anti-ſyphilitic virtues, although it forms a very uſeful addition to the compound decoction of ſarſaparilla, where pains of the limbs and indurations of the membranes remain after the venereal diſeaſe has been cured by mercury, and in many of thoſe cutaneous diſeaſes which are attended with aridity of the ſkin. A decoction of the green rind has alſo been recommended as a uſeful application to old ulcers.

JUNIPERUS.

Dioecia Monadelphia.—Nat. ord. *Coniferæ.*

Sp. Juniperus Communis. *Ed. Juniperus. Lond. Dub.*

Juniper.

Off.—Baccæ, Cacumen. The berries and tops.

This is an ever-green ſhrub, growing on heaths and hilly grounds in all parts of Europe: the berries are brought from Holland and from Italy. The Italian berries are in general reckoned the beſt. Juniper berries have a ſtrong not diſagreeable ſmell, and a warm pungent ſweet taſte, which if they are long chewed, or previouſly well bruiſed, is followed by a bitteriſh one. Their predominant conſtituents are eſſential oil, and a ſweet mucilaginous matter.

Medical uſe.—To the oil they are indebted for their ſtimulating carminative, diaphoretic, and diuretic properties. They are moſt commonly uſed in the form of infuſion, as a diuretic drink in

dropſy. The eſſential oil may be ſeparated by diſtillation. It poſſeſſes the ſame properties in a higher degree, and imparts them to ardent ſpirits. The peculiar flavour, and well-known diuretic effects of Hollands, are owing to the oil of Juniper. The decoction and extract are very inert preparations.

Every part of the plant contains the ſame eſſential oil; therefore an infuſion of the tops is likewiſe diuretic. The wood, alſo, was formerly officinal. In warm countries a reſin exudes from the juniper-tree. It is called ſandarac, and is often mixed with maſtich. It is not a pure reſin, for, according to Mr. Gieſe, about one fifth of it is not ſoluble in water or in alcohol, but in ether, reſembling in theſe reſpects copal.

Off. prep.—Ol. volat. *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.*

Sp. Juniperus Lycia. *Ed. Olibanum. Lond. Dub.*
Olibanum.

Off.—Gummi-reſina. A gum reſin.

Olibanum is principally collected in Arabia, and brought from Mecca to Cairo, from whence it is imported into Europe. It conſiſts of tranſparent brittle grains of different ſizes, not larger than a cheſnut, of a red or yellow colour, having little taſte, and a peculiar aromatic ſmell. Neumann got from 480 grains, 346 alcoholic, and 125 watery extract, and inverſely 200 watery, and 273 alcoholic. The diſtilled ſpirit and oil both ſmelt of olibanum, but no oil ſeparated. It forms a tranſparent ſolution with alcohol, and a milky fluid when triturated with water: it is not fuſible, but inflammable, and burns with an agreeable ſmell. It is the frankincenſe of the ancients; and the diffuſion of its vapour around the altar ſtill forms part of the ceremonies of the Greek and Roman Catholic churches.

Sp. Juniperus Sabina. *Ed. Sabina. Lond. Dub.*
Savine.

Off.—Folium. The leaf.

This is an evergreen ſhrub, a native of Siberia and Tartary, but not unfrequent in our gardens. The leaves have a bitter, acrid, biting taſte, and a ſtrong diſagreeable ſmell: diſtilled with water, they yield an eſſential oil, in conſiderable quantity.

Medical uſe.—Savine is a warm ſtimulating medicine, capable of producing diaphoreſis, and increaſing all the ſecretions, but apt to excite hæmorrhagy, eſpecially from the uterus. It is alſo recommended as an anthelmintic, and ſaid to be very efficient in the cure of gout.

Internally, a conſerve of the freſh leaves is exhibited in doſes of from half a drachm to a drachm.

Externally, the leaves are applied in the form of powder or in-

fusion, to warts, carious bones, and old ulcers; and in cases of gangrene, psora, and tinea; an excellent issue ointment is also prepared with the powder. The essential oil is a very active remedy.

Off. prep.—Ol. volat. *Ed. Dub.* Extract. *Lond.*

KÆMPFERIA ROTUNDA. *Zedoaria. Lond.*

Willd. g. 12, *sp.* 2. *Monandria Monogynia*—Nat. ord. *Scitamineæ.*

Round Zedoary.

Off.—Radix. The root.

THIS is a perennial plant, a native of India. The roots are about an inch long, somewhat rough on the surface, and often terminate in a point. They correspond in sensible qualities with the roots of the amomum zedoaria, but are not so strong. By some, indeed, they are supposed to be produced from the same plant, and that the round zedoary is the upper, and the long zedoary the under part of the root.

KINO. *Ed. Resina. Lond. Dub.*

Succus spissatus Eucalypti resiniferæ, *White iter.* Kino, the inspissated juice of the brown gum tree of Botany Bay.

I HAVE found in commerce three kinds of kino, easily distinguished by their external characters.

The first is in very small jet black fragments, perfectly opaque, without smell, crackling under the teeth when chewed, not colouring the saliva, after some time imparting only a slight astringent taste, not fusible, and difficultly reduced to powder. Powder dark chocolate brown. Although this has been the longest known in commerce in this place, it does not seem to be that described by Fothergill as the produce of the Pau de Sangue, and I have not been able to trace the place of its origin.

The second is in large fragments, on some of which the impression of the vessel into which it had been received while fluid, and in which it had hardened was evident, colour very dark brown, fracture resinous, appearance homogeneous, with small air bells, in very thin splinters transparent, and of a ruby red colour, crackling under the teeth when chewed, taste at first somewhat acid, but afterwards becoming considerably bitter and astringent, succeeded by a peculiar sweetness, infusible, and friable; powder of a reddish brown. This is said to be the extract of the Cocoloba uvifera, and indeed exactly resembles specimens certainly known to be such.

The third is in dark brown masses of various sizes, either smooth or rounded on the surface, or in fragments often covered with a reddish brown powder, fracture resinous and very unequal, appearance sometimes homogeneous, but more commonly heterogenous, mixed with bits of twigs, leaves, &c. splinters transpar-

ent, ruby red, no ſmell, ſcarcely crackling under the teeth, but ſometimes gritty from the accidental mixture of ſand, taſte ſimply aſtringent, ſucceeded by ſweetneſs, and, when long chewed, a portion adheres to the teeth; infuſible and friable; powder reddiſh brown. This is certainly obtained from the Eucalyptus reſinifera, or brown gum tree of New-South Wales, by allowing the juice, which either flows from it ſpontaneouſly, or is procured by wounding the tree, to harden in the ſun. Some ſpecimens of it in its fluid ſtate have even reached this country.

The analyſis of kino, publiſhed in the firſt edition of this Diſpenſatory, has ſince been confirmed by Vauquelin, as well as the concluſion drawn from them, that it conſiſts principally of tannin, and cannot with propriety be claſſed among the gum-reſins. But the undoubted origin of the third kind, and the examination of a red aſtringent matter picked from a cavity in the Caſſuarina, or beef-wood, prove that I was haſty in ſuppoſing that kino was always obtained from aſtringent barks by decoction and evaporation. Kino is much more ſoluble in boiling, than in cold, water. The decoction therefore on cooling, becomes turbid with a very copious red ſediment. The reſiduum ſeems to be ſoftened by the heat of boiling water, at leaſt it agglutinates into maſſes reſembling melted red ſealing wax dropt into water. By repeated decoctions with very large quantities of water, I have never been able to exhauſt it of its ſoluble parts: the laſt decoctions had ſtill a deep red colour, and blackened ſolutions of iron. Nor is this reſiduum more ſoluble in alcohol, and is not fuſible, but when thrown on live coals burns away without flame. Vauquelin obſerved that when the whole quantity of water neceſſary to diſſolve the ſoluble parts of kino is not employed at once, the reſiduum becomes more inſoluble. Alcohol diſſolves the whole of the Botany-bay kino except its impurities. With a certain proportion of water this tincture lets fall a copious red precipitate, which may be ſeparated by filtration, but with a larger proportion of water its tranſparency is only ſlightly diſturbed. The ſolutions of kino precipitate gelatine; and, according to Vauquelin, ſilver, lead, and antimony, white; and, iron, green. I find that it reſembles other aſtringents, in forming a black precipitate with red ſulphate of iron, which, however, is converted into green by the ſlighteſt exceſs of the ſulphate, and by a larger exceſs is diſſolved into a bright green liquid.

Medical uſe.—It is a powerful remedy in obſtinate chronic diarrhœas and dyſenteries; in all paſſive hæmorrhagies, eſpecially from the uterus; in fluor albus; and in diſeaſes ariſing from laxity of the ſolids.

It is exhibited internally, in doſes of from ten to thirty grains, in ſubſtance, or diſſolved in diluted alcohol.

Externally, it is applied as a ſtyptic, to check hæmorrhagien

from wounds or ulcers, and to diminiſh the diſcharge of ſanious or ichorous matter from ill-conditioned ulcers.

Off. prep.—Tinct. *Ed. Dub.* Elect. catechu. *Ed. Dub.*

LACTUCA VIROSA. *Ed.*

Willd. g. 1404, *ſp.* 12. *Syngeneſia æqualis.*—Nat.ord. *Compoſitæ ſemifloſculoſæ.*

Strong-ſcented or wild lettuce.

Off.—Folium. The leaves.

THIS plant is biennial, and grows wild on rubbiſh and rough banks, in many places in this country.

It ſmells ſtrongly of opium, and reſembles it in ſome of its effects; and its narcotic power, like that of the poppy heads, reſides in its milky juice.

The garden lettuce when in flower it alſo very bitter, and abounds with a milky juice, in its taſte and ſmell remarkably like opium, for which when dried it has been propoſed and uſed with ſucceſs as a ſubſtitute. Before it begins to ſhoot, it has none of that bitterneſs, and contains no milky juice, and probably has not thoſe ſoporific effects which are commonly aſcribed to the uſe of lettuce.

Medical uſe.—An extract, prepared from the expreſſed juice of the leaves of the plant, gathered when in flower, is recommended in ſmall doſes in dropſy. In dropſies of long ſtanding, proceeding from viſceral obſtructions, it has been given to the extent of half an ounce a-day. It is ſaid to agree with the ſtomach, to quench thirſt, to be gently laxative, powerfully diuretic, and ſomewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin of Vienna aſſerts, that out of twenty-four dropſical patients, all but one were cured by this medicine.

Off. prep.—Succus ſpiſſat. *Ed.*

LAURUS.

Willd. g. 798. *Enneandria Monogynia.*—Nat. ord. *Oleraceæ.*

Sp. 1. LAURUS CINNAMOMUM. *Ed. Cinnamomum. Lond. Dub.*

The cinnamon tree.

Off.—Cortex et ejus oleum eſſentiale. The bark and its eſſential oil.

THIS valuable tree is a native of Ceylon, where it was guarded with unremitting jealouſy by the Dutch, that they might monopolize the commerce of its productions. They failed, however, in the attempt; and cinnamon trees are found, not only in other parts of the Eaſt Indies, but alſo in Jamaica, and other iſlands of the Weſt Indies. Ceylon now belongs to the Britiſh, and Captain Percival has publiſhed a very intereſting account of the

cinnamon tree. It is found in greateſt perfection in the immediate neighbourhood of Columbo, and grows from four to ten feet high, very buſhy. The leaves reſemble thoſe of the laurel, and have the hot taſte and ſmell of cloves when chewed. The bloſſom is white and very abundant, but diffuſes no odour. The fruit reſembles an acorn, and a ſpecies of fixed oil is obtained from it. There are ſeveral different ſpecies of cinnamon trees, or trees reſembling them, in Ceylon, but four only are barked by government; the honey cinnamon, the ſnake cinnamon, the camphor cinnamon, which is inferior to theſe, and yields camphor from its roots, and mixed with gum from inciſions made into it, and the *cabatte* cinnamon, which is harſher and more aſtringent than the others. The bark is collected at two ſeaſons; the grand harveſt laſts from April to Auguſt, the little harveſt is in December. Such branches as are three years old are lopped off, the epidermis is then ſcraped off, the bark ſlit up, looſened, and removed entire ſo as to form a tube open at one ſide. The ſmaller of theſe are inſerted within the larger, and they are ſpread out to dry. They are then packed up in bundles. The taſting of theſe bundles to aſcertain their quality is a very diſagreeable duty impoſed on the ſurgeons, as it excoriates the tongue and mouth, and cauſes ſuch intolerable pain as renders it impoſſible for them to continue the preparations two or three days ſucceſſively. In their turns, however, they are obliged to reſume it, and they attempt to mitigate the pain by occaſionally eating a piece of bread and butter. It is then made up into large bundles about four feet long, and eighty pounds in weight. In ſtowing the bales on ſhipboard, the interſtices are filled up with black pepper, which is ſuppoſed to improve both ſpices.

The beſt cinnamon is rather pliable, and ought not much to exceed ſtout writing paper in thickneſs It is of a light yellowiſh colour; it poſſeſſes a ſweet taſte, not ſo hot as to occaſion pain, and not ſucceeded by any after taſte. The inferior kind is diſtinguiſhed by being thicker, of a darker and browniſh colour, hot, and pungent when chewed, and ſucceeded by a diſagreeable bitter after taſte. The Dutch were accuſed of deteriorating their cinnamon by mixing it with a proportion of real cinnamon, but which had been deprived of its eſſential oil by diſtillation. This fraud could only be detected by the weaker ſmell and taſte. It is alſo often mixed with caſſia bark. This laſt is eaſily diſtinguiſhable by its fracture being ſmooth, and by its ſlimy mucilaginous taſte, without any thing of the roughneſs of the true cinnamon.

By diſtillation with water, it furniſhes a ſmall quantity of very pungent and fragrant oil, the water itſelf remains long milky, and has a ſtrong flavour of cinnamon. The watery extract in Neu-

mann's experiment amounted to 720 from 7680 parts. With alcohol the oil does not ariſe in diſtillation, but remains in the extract, which amounts to 960.

The eſſential oil of cinnamon has a whitiſh yellow colour, a pungent burning taſte, and the peculiar fine flavour of cinnamon in a very great degree. It ſhould ſink in water, and be entirely ſoluble in alcohol. It is principally prepared in Ceylon.

Medical uſe.—Cinnamon is a very elegant and uſeful aromatic, more grateful both to the palate and ſtomach than moſt other ſubſtances of this claſs. Like other aromatics, the effects of cinnamon are ſtimulating, heating, ſtomachic, carminative, and tonic; but it is rather uſed as as an adjunct to other remedies, than as a remedy itſelf.

The oil is one of the moſt powerful ſtimulants we poſſeſs, and is ſometimes uſed as a cordial in cramps of the ſtomach and in ſyncope; or as a ſtimulant in paralyſis of the tongue, or to deaden the nerve in toothach. But it is principally employed as an aromatic, to cover the leſs agreeable taſte of other drugs.

Off. prep.—Aq. deſt. *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.* Tinct. *Ed. Lond. Dub.* Tinct. card, comp. *Lond. Dub.* Spt. lav. comp. *Lond. Ed. Dub.* Tinct. catechu, *Ed. Lond.* Acid. ſulph. arom. *Ed.* Emp. lad. comp. *Lond.*

Sp. 2. Laurus Cassia. *Ed.* *Caſſia Lignea. Dub.*

The caſſia tree.

Off.—Cortex, flos nondum explicitus. The bark and flower-buds gathered before they open.

This tree is very ſimilar to the former. The bark, which is imported from different parts of the Eaſt Indies and from China, has a great reſemblance to the true cinnamon, from which it is only diſtinguiſhable, by being of a thicker and coarſer appearance, and by its breaking ſhort and ſmooth, while the cinnamon breaks fibrous and ſhivery.

It reſembles cinnamon ſtill more exactly in its aromatic flavour and pungency than in its external appearance, and ſeems only to differ from it in being conſiderably weaker, and in abounding more with a mucilaginous matter.

Caſſia buds are the flower-buds which are gathered and dried before they expand. They have the appearance of a nail, conſiſting of a round head, about the ſize of a pepper-corn, ſurrounded with the imperfect hexangular corolla, which gradually terminates in a point. They have a brown colour, and the ſmell and taſte of cinnamon.

Medical uſe.—Both the bark and buds of caſſia poſſeſs the ſame properties with cinnamon, though in an inferior degree.

The bark is very frequently, and ſometimes unintentionally, ſubſtituted for the more expenſive cinnamon; and the products obtained from caſſia bark and buds by diſtillation, are in no reſpect inferior to thoſe prepared from cinnamon.

Off. prep.—Aq. deſt. *Ed.* Pulv. arom. *Ed. Lond Dub.* Pulv. carb. calcis, *Ed. Lond.* Elect. arom. *Dub.* Conf. arom. *Lond.* Elect. catechu, *Lond. Dub.* Troch. cretæ, *Lond.*

Sp. 3. LAURUS CAMPHORA. *Ed. Lond. Dub.*
Camphor tree.
Off.—Camphora. Camphor.

THE camphor laurel grows in great abundance, and to a very conſiderable ſize, in the foreſts of Japan. It is not uncommon in green houſes in England. Every part of the tree ſmells ſtrongly of camphor, which is obtained from the trunk, branches, and root, by diſtillation. They are cut down into ſmall pieces, and put into a ſtill with a quantity of water. After the water has been kept boiling forty-eight hours, the camphor is found adhering to the ſtraw with which the head of the ſtill is lined. In this ſtate it is imported by the Dutch, and is called crude camphor. It is very impure, conſiſting of ſmall browniſh or dirty-grey grains, mixed with ſtraw, wood, hair, and other impurities. From theſe it is purified in Holland, by a ſecond ſublimation in glaſs veſſels; being previouſly mixed with quicklime, to combine with and prevent any empyreumatic oil with which it may be contaminated from ſubliming, while the camphor concretes in the upper part of the veſſel into cakes, convex on the one ſide, and concave on the other, about two or three inches thick, thinner at the edges, and generally perforated in the middle.

Pure camphor is lighter than water, very white, pellucid, ſomewhat unctuous to the touch, brittle, yet tough and elaſtic, ſo as to be ſcarcely pulverizable; ſhining in its fracture, and cryſtalline in its texture; of a bitteriſh, aromatic, pungent, taſte, yet accompanied with a ſenſe of coolneſs, of a ſtrong and very penetrating ſmell; very volatile, inflammable, burning entirely away without leaving any coal or aſhes; capable of combining with the fixed and volatile oils, reſins, and balſams; ſoluble in alcohol, ether, and the concentrated ſulphuric, nitric, and acetic acids; ſeparable from theſe alcoholic and acid ſolutions by water; inſoluble in water, alkalies, and the weaker acids; decompoſable by heat when mixed with alumina, being converted into an eſſential oil and charcoal; and by treating it with nitric acid, which acidifies it, producing camphoric acid.

But the production of camphor is not confined to the laurus camphora, although it furniſhes almoſt all the camphor of com-

merce; it is ſound in very great purity in interſtices among the woody fibres of an unknown tree in Borneo; it is alſo contained in the roots of the laurus cinnamomum and caſſia, Alpinia galanga, amomum zedoaria, &c.; in the ſeeds of the amomum cardamomum, piper cubeba, &c.; and in many indigenous plants, as in the thymus ſerpyllum and vulgaris, juniperus communis, roſmarinus officinalis, ſalvia officinalis, mentha piperita, &c. and may be ſeparated from the eſſential oils of roſemary, lavender, marjoram, and ſage. It is therefore now univerſally conſidered as a peculiar principle of vegetables, and not as a reſin, as ſtated by the Dublin college.

Medical uſe.—Camphor is a very active ſubſtance when taken into the ſtomach. It increaſes the heat of the body conſiderably, and gives a tendency to diaphoreſis, but without quickening the pulſe. At firſt it raiſes the ſpirits, but produces a ſubſequent depreſſion; and it facilitates voluntary motion. In exceſſive doſes it cauſes ſyncope, anxiety, retchings, convulſions, and delirium. Theſe violent effects of camphor are moſt effectually counteracted by opium.

In a morbid ſtate of the body, camphor allays inordinate actions. When the pulſe is hard and contracted, it renders it fuller and ſofter. It removes ſpaſms, and flitting pains ariſing from ſpaſms; and in delirium, when opium fails of procuring ſleep, camphor will often ſucceed. It is alſo ſaid to correct the bad effects of opium, mezereon, cantharides, and the draſtic purgatives and diuretics.

The moſt general indication for the uſe of camphor, is the languor or oppreſſion of the *vis vitæ*. It may therefore be given with advantage,

1. In all febrile diſeaſes of the typhoid type, eſpecially when attended with delirium.
2. In inflammations with typhoid fever, as in ſome caſes of peripneumonia and rheumatiſm.
3. In eruptive diſeaſes, to favour the eruption, or to bring it back to the ſkin, if from any cauſe it has ſuddenly receded, as in ſmall-pox, meaſles, &c.
4. In many ſpaſmodic diſeaſes, eſpecially mania, melancholy, epilepſy, hyſteria, chorea, hiccough, &c.
5. In indolent local inflammations, not depending upon an internal cauſe, to excite action in the part.

As from its great lightneſs it is apt to ſwim upon the contents of the ſtomach, and to occaſion pain at its upper orifice, it is neceſſary that it be always exhibited in a ſtate of minute diviſion. In order to reduce it to powder, it muſt be previouſly moiſtened with a little alcohol. It may then be given,

1. In powder, with ſugar, magneſia, and nitrate of potaſs.
2. In pills, with the fetid gums and mucilage.
3. In ſolution, in alcohol, oil, or acetic acid.
4. Suſpended in the form of an emulſion, by means of mucilage, ſugar, yolk of egg, almonds, vinegar, &c.

Internally, it may be given in ſmall doſes, of from one to five grains, repeated at ſhort intervals, as its effects are very tranſient, or in large doſes, not under twenty grains.

Off. prep.—Ol. camph. *Ed.* Emulſio, *Ed. Lond.* Tinct. *Ed. Lond. Dub.* Acid. acet. camph. *Ed.* Tinct. opii camph. *Lond. Dub.* Tinct. ſap. *Ed.* Tinct. ſap. cum opio, *Ed.* Linim ſap. *Lond. Dub.* Linim camph. comp. *Lond. Dub.* Cerat. lith. acet. comp. *Lond. Dub.*

Sp. 10. Laurus Nobilis. *Ed.* *Laurus. Lond.*
Bay tree.

Off.—Folium, Bacca ejuſque oleum fixum, The leaves, berries, and expreſſed oil of the berries.

This tree is a native of the ſouth of Europe, but bears the winters of this climate perfectly well. Both leaves and berries contain a conſiderable quantity of eſſential oil, which renders them aromatic ſtimulating ſubſtances.

The berries are generally brought from the Mediterranean, and are more pungent than the leaves. In Spain and Italy a conſiderable quantity of oil is obtained by expreſſion from the freſh berries. It has a green colour, and ſtrong aromatic taſte and ſmell. As it therefore is not a fixed oil, but a mixture of fixed and volatile oil, and as its peculiar properties depend entirely on the preſence of the latter, it is incorrectly ſtated to be a fixed oil by the Edinburgh college. It ſhould rather have been denominated, from the mode of its preparation, an expreſſed oil.

Med. uſe.—It is only uſed externally as a ſtimulant.

Off. prep.—Decoct. pro foment. *Lond.* Catapl. cumini, *Lond.* Emp. cumini. *Lond.*

Sp. 34. Laurus Sassafras. *Ed.* *Saſſafras. Lond. Dub.*
Saſſafras.

Off.—Lignum, radix, eorumque cortex. The wood, root, and bark.

This tree is a native of North-America, and is cultivated in Jamaica. It is the root which is commonly employed. It is brought to us in long branched pieces. It is ſoft, light, and of a ſpongy texture; of a ruſty white colour; of a ſtrong pleaſant ſmell, reſembling that of fennel; and a ſweetiſh, aromatic ſubacrid taſte. The bark is rough, of a brown aſh colour on the out-

ſide, and ferruginous colour within; ſpongy and diviſible into layers, and of a ſtronger taſte and ſmell than the wood.

Neumann got from 480 grains 80 of alcoholic, and afterwards 60 of watery extract, and inverſely 120 watery and 7.5 alcoholic. In diſtillation the alcohol elevates nothing, but water a ponderous eſſential oil, in the proportion of about 10 from 480.

Med. uſe.—Saſſafras, from the quantity of volatile oil it contains, is a gently ſtimulating, heating, ſudorific, and diuretic remedy.

It is beſt given in infuſion. The decoction and extract are mere bitters, as the oil is diſſipated by the preparation.

The eſſential oil may be obtained ſeparate by diſtillation. It is of a whitiſh, yellow colour, and ſinks in water. It is highly ſtimulating and heating, and muſt be given only in very ſmall doſes.

Off. prep.—Ol. volat. *Ed. Lond.* Decoct. guaiaci comp. *Ed.* Decoct. ſarſ. comp. *Lond. Dub.*

LAVANDULA SPICA. *Ed.* *Lavendula Flos. Lond.* *Lavendula. Dub.*

Willd. g. 1099, *ſp.* 1. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Lavender.

Off.—Spica florens. The flowering ſpikes.

Lavender is a well known ſmall, ſhrubby, perennial plant, a native of the ſouth of Europe, but frequently cultivated in o gardens for the ſake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable ſmell, and a warm, pungent, bitteriſh taſte; the broad-leaved ſort is the ſtrongeſt in both reſpects, and yields in diſtillation thrice as much eſſential oil as the other; its oil is alſo hotter and ſpecifically heavier: hence, in the ſouthern parts of France, where both kinds grow wild, this only is uſed for the diſtillation of what is called Oil of Spike. The narrow-leaved is the ſort commonly met with in our gardens.

Medical uſe.—Lavender is a warm ſtimulating aromatic. It is principally uſed as a perfume.

Off. prep.—Ol. volat. *Ed. Lond.* Spiritus, *Ed. Lond. Dub.* Pulv. aſari comp. *Ed. Lond. Dub.*.

LEONTODON TARAXACUM. *Ed.* *Taraxacum. Lond. Dub.*

Willd. g. 1407, *ſp.* 1. *Syngeneſia Æqualis.*—Nat. ord. *Compoſitæ ſemifloſculoſæ.*

Dandelion.

Off.—Folium, radix. The root and leaves.

This perennial plant is very common in graſs fields and uncul-

tivated places. The whole plant contains a bitter milky juice, which, however, is moſt abundant in the roots before the flower-ſtem ſhoots. The bitterneſs is deſtroyed by drying, and, therefore, the recent roots only ſhould be uſed.

Medical uſe.—Its vulgar name Piſs-a-bed, ſhews a popular belief of its poſſeſſing diuretic properties; and it was lately a very faſhionable remedy in Germany, given in the form of an expreſſed juice or decoction, or extract prepared from either of them; but it ſeems to be merely a mucilaginous bitter.

LILIUM CANDIDUM. *Liliam album. Dub.*
Willd. g. 127, *ſp.* 3. *Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*
The white lily.
Off.—Radix. The root.

The white lily is a perennial, bulbous-rooted plant, a native of the ſouth of Europe, and cultivated in our gardens for the beauty of its flowers. The mucilaginous root is ſometimes uſed as a poultice; but it poſſeſſes no advantage over the poultices formed of any vegetable farina.

LINUM.
Willd. g. 590. *Pentandria Pentagynia.*—Nat. ord. *Gruinales.*

Sp. 1. Linum Usitassimum. *Ed. Linum. Lond. Dub.*
Common flax.
Off.—Semen, ejuſque oleum fixum. The ſeed, and oil expreſſed from the ſeed. Linſeed, and linſeed oil.

This valuable annual plant is ſaid to have come originally from thoſe parts of Egypt which are expoſed to the inundations of the Nile. It now grows wild among our fields, in the ſouth of England, and many other parts of Europe, and is cultivated in large quantities.

Linſeed contains about one fifth of mucilage, and one ſixth of fixed oil. The mucilage reſides entirely in the ſkin, and is ſeparated by infuſion or decoction. The oil is ſeparated by expreſſion. It is one of the cheapeſt fixed oils; but is generally rancid and nauſeous, and unfit for internal uſe. The cake which remains after the expreſſion of the oil, contains the farinaceous and mucilaginous part of the ſeed, and is uſed in fattening cattle, under the name of Oil-cake.

Med. uſe.—Linſeed is conſidered as emollient and demulcent. The entire ſeeds are only uſed in cataplaſms. The infuſion is uſed as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corroſive ſublimate.

Off. prep.—Oleum fixum, *Ed. Lond. Dub.* Oleum lini cum calce, *Ed.*

Sp. 26. LINUM CATHARTICUM. *Dub.*
Purging flax.
Off.—Herba. The herb.

THIS is an annual plant, found wild on dry meadows and paſtures in Britain. Its virtue is expreſſed in its title: an infuſion in water or whey of a handful of the freſh herb, or a drachm of them in ſubſtance when dried, are ſaid to purge without inconvenience.

LOBELIA SYPHILITICA. *Ed.*
Syngeneſia Monogynia.—Nat. ord. *Campanaceæ.*
Blue cardinal flower.
Off.—Radix. The root.

THIS plant grows in moiſt places in Virginia, and bears our winters. It is perennial, has an erect ſtalk three or four feet high, blue flowers, a milky juice, and a rank ſmell. The root conſiſts of white fibres about two inches long, reſembles tobacco in taſte, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton ſays, that it is conſiderably diuretic, and Mr. Pearſon found, that it generally diſagreed with the ſtomach, and ſeldom failed of affecting the bowels as a ſtrong cathartic. It certainly poſſeſſes no power of curing ſyphilis; even the Indians, when they have the diſeaſe, are glad of an opportunity of applying to the whites.

MALVA SYLVESTRIS. *Ed.* *Malva. Lond.*
Willd. g. 1290, *ſp.* 43. *Monadelphia Polyandria.*—Nat. ord. *Columniferæ.*
Common mallow.
Off.—Folium, flos. The leaves and flowers.

THIS is an annual plant, common in Britain, under hedges, near footpaths, and among rubbiſh.

The whole plant abounds with mucilage. The leaves were formerly of ſome eſteem, in food, for looſening the belly; at preſent, decoctions of them are ſometimes employed in dyſenteries, heat, and ſharpneſs of urine, and in general for obtunding acrimonious humours; their principal uſe is in emollient glyſters, cataplaſms, and fomentations.

Off. prep.—Decoct. pro enemat. *Lond.*

MARRUBIUM VULGARE. *Ed. Lond. Dub.*
Willd. g. 1111, *ſp.* 8. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*
White horehound.
Off.—Folium. The leaves.

This is a perennial plant, which grows wild on road ſides, and among rubbiſh. The leaves have a very ſtrong, not diſagreeable ſmell, and a roughiſh, very bitter taſte. Neumann got from 480 grains, 270 watery, and 30 alcoholic extract, and inverſely 150 alcoholic, and 140 watery. They promote the fluid ſecretions in general, and liberally taken, looſen the belly.

MEL. *Lond. Dub.*

Honey.

This is a well-known ſubſtance, and although it is moſt probably of vegetable origin, we do not procure it in any quantity except as an animal excretion, from the bee, (apis mellifica). This induſtrious inſect, in the ſummer time, flies from flower to flower to collect the ſweet juice ſecreted in them. When ſufficiently loaded, it returns to its hive, where it depoſits it, as a winter's ſupply, in the cells of the comb it had prepared of wax to receive it. What change it undergoes in the body of the inſect is unknown; but it is certain, that honey varies very much, according to the nature of the plants from which it is collected. In ſome ſituations, where poiſonous plants abound, it is even deleterious.

The beſt honey is that which is freeſt from colour, and contains the largeſt grains when it concretes. For medical uſe, it ſhould alſo be as free of flavour as poſſible. That obtained from young bees, and which flows ſpontaneouſly from the combs, is the pureſt and fineſt, and is known by the name of Virgin honey. When ſeparated from the wax by expreſſion, it is leſs pure; and there is another ſort ſtill inferior, obtained by heating the combs before they are put into the preſs.

Honey conſiſts principally of ſugar, but it alſo probably contains mucilage and an acid, and is often impregnated with the eſſential oil of the flowers from which the bees have gathered it, as in the perfumed honey of the Crimea. In ſome parts of Aſia and America, poiſonous honey is met with, from the bees feeding on poiſonous flowers. Neumann exſiccated honey in the water bath: the vapour which aroſe, he ſays, took fire on the approach of a candle, and diffuſed its ſmell widely; and the liquor which was condenſed was manifeſtly impregnated, both with the ſmell and taſte of honey, and amounted to three ounces from eight of honey.

Medical uſe—From the earlieſt ages it has been employed as a medicine. Beſides the general properties of ſaccharine bodies, it poſſeſſes others peculiar to itſelf, probably depending on the preſence of an acid. For internal uſe, ſugar is always to be preferred, as honey in ſome conſtitutions produces gripes and colic pains. From its ſtimulus, however, it forms an excellent gargle, and fa-

cilitates the expectoration of viſcid phlegm, and is ſometimes employed as an emollient application to abſceſſes, and as a detergent to ulcers.

Off. prep.—Mel deſpum. *Lond. Dub.* Mel. acet. *Lond. Dub.* Oxymel colchici, *Lond.* Mel roſæ. *Lond. Dub.* Mel ſcillæ, *Lond. Dub.* Oxymel ſcillæ, *Lond.* Oxymel æruginis, *Lond.*

MELALEUCA LEUCADENDRON. *Ed. Cajeputa officinarum.*

Polyadelphia Polyandria.—Nat. ord. *Heſperideæ.*

The cajeput tree.

Off.—Oleum volatile. The eſſential oil.

The tree which furniſhes the cajeput oil is frequent on the mountains of Amboyna, and other Molucca iſlands. It is obtained by diſtillation from the dried leaves of the ſmaller of two varieties. It is prepared in great quantities, eſpecially in the iſland of Banda, and ſent to Holland in copper flaſks. As it comes to us it is of a green colour, very limpid, lighter than water, of a ſtrong ſmell, reſembling camphor, and a ſtrong, pungent taſte, like that of cardamoms. It burns entirely away, without leaving any reſiduum. It is often adulterated with other eſſential oils, coloured with the reſin of milfoil. In the genuine oil, the green colour depends on the preſence of copper; for when rectified it is colourleſs.

Medical uſe.—Like other aromatic oils it is highly ſtimulating, and is principally recommended in hyſteria, epilepſy, flatulent colic, and paralyſis of the tongue. The doſe is from one to four drops on a lump of ſugar.

It is applied externally where a warm and peculiar ſtimulus is requiſite; and is employed for reſtoring vigour after luxations and ſprains; and for eaſing violent pain in gouty and rheumatic caſes, in toothach, and ſimilar affections.

MELISSA OFFICINALIS. *Ed. Meliſſa. Lond.*

Willd. g. 1118, *ſp.* 1. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Balm.

Off.—Herba. The herb.

Balm is a perennial plant, which grows wild on the Alps and Pyrennees, and is frequently cultivated in our gardens. It has a pleaſant ſmell, ſomewhat of the lemon kind; and a weak, roughiſh, aromatic taſte. The young ſhoots have the ſtrongeſt flavour; the flowers, and the herb itſelf when old, or produced in very moiſt rich ſoils or rainy ſeaſons, are much weaker both in ſmell and taſte.

It is principally uſed in the form of a watery infuſion, which is drunk in the manner of tea.

MELOË VESICATORIUS. *Ed.* *Cantharis. Lond.* *Cantharides. Dub.* *Lytta Veſicatoria*, Fabricii.

Inſecta Coleoptera, Veſicantia.

Spaniſh fly. Bliſtering fly.

These inſects have a longiſh, green, and gold-ſhining body, with flexible green-ſtriped elytera, which cover the whole back of the body, and under which are their brown membranous wings. On their head they have two black articulated feelers. They are found on the fraxinus, ſambucus, ſalix, liguſtrum, &c. in Spain, Italy, France, and Germany. The largeſt come from Italy, but the Spaniſh cantharides are preferred. They are gathered by ſhaking the trees on which they are found, and catching them on a cloth ſpread beneath it. They are then killed by the fumes of vinegar, and dried carefully in a ſtove. The melolontha vitis is ſometimes found mixed in conſiderable numbers with the cantharides. They are eaſily diſtinguiſhed by their almoſt ſquare body; and as probably they do not ſtimulate the ſkin, they ſhould be picked out before the cantharides are powdered.

The analyſis of cantharides, notwithſtanding the experiments of Thouvenel and Beaupoil, is ſtill extremely imperfect. Lewis aſcertained that their active conſtituent is entirely ſoluble both in water and in alcohol; for extracts made with each of theſe ſolvents bliſtered, as far as could be judged, equally, and as effectually as cantharides in ſubſtance. Both the reſidua were inactive. Neumann got from 1920 grains, 920 watery, and afterwards, 28 alcoholic extract; and inverſely, 400 alcoholic, and 192 watery.

Med. uſe.—Cantharides have a peculiar nauſeous ſmell, and an extremely acrid burning taſte. Taken internally, they often occaſion a diſcharge of blood by urine, with exquiſite pain. If the doſe be conſiderable, they ſeem to inflame and ulcerate the whole inteſtinal canal; the ſtools become mucous and purulent; the breath fetid and cadaverous; intenſe pains are felt in the lower belly; the patient faints, grows giddy, delirious, and dies. Applied to the ſkin, they firſt inflame, and afterwards excoriate the part, raiſing a more perfect bliſter than any of the vegetable acrids, and occaſioning a more plentiful diſcharge of ſerum; but even the external application of cantharides is often followed by a ſtrangury, accompanied with thirſt and feveriſh heat.

The inconveniencies ariſing from the uſe of cantharides, whether taken internally, or applied externally, are beſt obviated by drinking plentifully of bland emollient liquids, ſuch as milk, emulſions, &c. The ſpecific property of counteracting cantharides aſcribed to camphor has no foundation.

The internal uſe of cantharides is at all times doubtful, and requires the moſt prudent management. They have, however,

been fometimes employed with fuccefs in dropfy, and in difeafes of the urinary organs, arifing from debility, efpecially gleet and leucorrhœa. They are given in fubftance, in very fmall dofes, or in tincture.

Applied externally, they are one of our beft and moft powerful remedies. By proper management, they may be regulated fo as to act as a gentle ftimulus, as a rubefacient, or as a blifter.

Blifters are applied,

1. To increafe the activity of the fyftem in general, by means of their irritation.
2. To increafe the activity of a particular organ.
3. To diminifh morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almoft all difeafes accompanied with typhus fever, efpecially if any important vifcus, as the brains, lungs, or liver, be at the fame time particularly affected. In thefe cafes, the blifters are not applied to the difeafed organs themfelves, but as near them as may be convenient. When we wifh to excite action in any organ, the blifters are, if poffible, applied directly to the difeafed organ.

Cantharides are employed externally, either in fubftance, mixed up with wax and refin, fo as to form a plafter or ointment, or in the form of tincture.

Off. prep.—Tinct. *Ed. Lond. Dub.* Ungt. infufi, *Ed. Lond. Dub.* Ungt. pulv. *Ed.* Cerat. *Lond. Dub.* Emp. *Ed. Lond. Dub.* Emp. comp. *Ed.*

MENTHA.

Willd. g. 1102. *Didynamia Gymnofpermia.*—Nat. ord. *Verticillatæ.*

Sp. 7. MENTHA VIRIDIS. *Mentha Sativa. Lond. Dub.*

Spearmint.

Off.—Herba. The plant.

SPEARMINT is perennial, and a native of Britain. The leaves have a warm, roughifh, fomewhat bitterifh tafte; and a ftrong, not unpleafant, aromatic fmell. Their virtues are ftomachic and carminative.

Off. prep.—Aq. deft. *Lond. Dub.* Oleum volat. *Lond. Dub.* Spiritus, *Lond.*

Sp. 13. MENTHA PIPERITA. *Ed.* *Mentha Piperitis. Lond. Dub.*

Peppermint.

Off.—Herba. The plant.

THIS ſpecies of mint is alſo perennial, and a native of Britain, where it is cultivated in very great quantities, for the ſake of its eſſential oil. The leaves have a ſtrong, rather agreeable ſmell, and an intenſely pungent, aromatic taſte, reſembling that of pepper, and accompanied with a peculiar ſenſation of coldneſs.

Its predominant conſtituents are eſſential oil and camphor, both of which riſe in diſtillation, and are combined in what is called Oil of Peppermint.

Med. uſe.—Peppermint is principally uſed as a carminative and antiſpaſmodic. The diſtilled water is a domeſtic remedy for flatulent colic, and the eſſential oil is often given with advantage, in doſes of a few drops, in cramps of the ſtomach.

Off. prep.—Aq. deſt. *Ed. Lond. Dub.* Ol. volat. *Ed. Lond. Dub.* Spirit. *Ed. Lond.*

Sp. 20. MENTHA PULEGIUM. *Ed.* *Pulegium. Lond. Dub.*

Penny-royal.

Off.—Herba, flos. The herb and flower.

THIS is alſo perennial, and a native of Britain. In its ſenſible qualities, it is warm, pungent and aromatic, ſomewhat ſimilar to ſpearmint but leſs agreeable. It is ſeldom uſed.

Off. prep.—Aq. deſt. *Ed. Lond. Dub.* Ol. volat. *Lond. Dub.* Spirit. *Lond.*

MENYANTHES TRIFOLIATA. *Ed.* *Trifolium paludoſum. Lond. Dub.*

Willd. g. 299, *ſp.* 4. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ.*

Marſh trefoil.

Off.—Folium. The leaves.

THIS perennial plant is very common in marſhy ſituations, and is one of the moſt beautiful of our native flowers.

The leaves grow by threes on footſtalks. They are exceſſively bitter, and their bitterneſs is extracted by infuſion. They are ſaid to be ſometimes uſed in brewing ale, and that one ounce will go as far as half a pound of hops.

Medical uſe.—A drachm of them in powder purges and vomits. In infuſion or extract they have been recommended in intermittents, in ſeveral cachectic and cutaneous diſeaſes. The doſe of the extract is from ten to twenty grains.

MIMOSA.
Polygamia Monoecia.—Nat. ord. *Lomentaceæ.*

Sp. Mimosa Catechu. *Ed.* *Catechu. Lond. Dub.*
Catechu.

Off.—Ligni extractum, vulgo Terra Japonica. The extract of the wood.

This tree is a native of Hindoftan. The extract of catechu, which was formerly termed, with peculiar impropriety, Japan earth, is principally prepared from the internal coloured part of the wood, by decoction, evaporation, and exficcation in the fun. But catechu is alfo prepared in India from feveral other fpecies of mimofa, and even from the woods, barks, and fruits of other genera.

There are two kinds of this extract; one is fent from Bombay, the other from Bengal. The extract from Bombay is of a uniform texture, and of a red brown tint, its fpecific gravity being generally about 1.39. The extract from Bengal is more friable and lefs confiftent. Its colour is like that of chocolate externally; but when broken, its fracture prefent ftreaks of chocolate and of red brown. Its fpecific gravity is about 1.28. Their taftes are precifely fimilar, being aftringent, but leaving in the mouth a fenfation of fweetnefs. They do not deliquefce, or apparently change by expofure to the air, and are not fufible.

By Mr. Davy's analyfis, 200 grains gave

	BOMBAY.	BENGAL.
Tannin, - -	109	97
Peculiar extractive matter, -	68	73
Mucilage, - -	13	16
Refidual matter, chiefly fand and calcareous earth, - -	10	14

This more exact analyfis confirms the obfervations made by me, in the firft edition of this Difpenfatory.

Med. ufe.—Catechu is one of the moft convenient and powerful aftringents we poffefs, and may be exhibited in every cafe where aftringents are indicated. It is particularly ferviceable in diarrhœa, in hoarfenefs from relaxation of the fauces, ulcers and aphthæ in the mouth, and in excoriations, with lymphatic exudations.

Off. prep.—Infuf. *Ed.* Elect. *Ed. Dub.* Tinct. *Ed. Lond.*

Sp. Mimosa Nilotica. *Ed.* *Gummi Arabicum. Lond. Dub*
Gum Arabic.

Off.—Gummi. The gum.

This ſpecies of mimoſa grows in Arabia Petræa and Egypt. The greateſt quantity of pure gum, commonly called Gum Arabic, is furniſhed by this tree, from which it exudes either ſpontaneouſly, or from inciſions made into the bark, and afterwards hardens in the air. But a ſimilar gum may be obtained from all the ſpecies of mimoſa, and from many other trees, ſuch as the Swietenia febrifuga, Melia azadirachta, and the different ſpecies of Terminalia. It is remarkable that the barks of all the trees which furniſh this bland mucilaginous ſubſtance, are highly aſtringent; that of the Mimoſa nilotica itſelf is uſed in India for tanning; and in our country, the cherry and plumb trees, which ſometimes yield a little gum, have very aſtringent barks.

There are two kinds of gum found in the ſhops, and ſold under the ſame name, Gum Arabic, which comes from the Levant, and Eaſt-India gum. Gum Arabic conſiſts of roundiſh tranſparent tears, colourleſs, or of a yellowiſh colour, ſhining fracture, without ſmell or taſte, and perfectly ſoluble in water. The pieces which are moſt tranſparent, and have leaſt colour, are reckoned the beſt. They are ſelected from the Gum Arabic in ſorts, and ſold for about double the price, under the title of Picked gum. The Eaſt-India gum is darker coloured than Gum Arabic, and is not ſo readily ſoluble in water. I poſſeſs a maſs of gum, gathered from a mimoſa in New South Wales, by Mr. Jamieſon, who is engaged in preparing for the preſs a moſt ſplendid and ſcientific deſcription of that country. It is darker coloured even than Eaſt-India gum, and is alſo leſs ſoluble than it; for when ſuſpended in water it gives off white films, which float through the mucilage. But its moſt remarkable property is, that it does not precipitate ſilicized potaſs; in which reſpect it agrees, as far as my experiments go, with gum collected in this neighbourhood, from the common cherry and plumb trees. It is alſo remarkable that the coarſeſt gum forms the thickeſt mucilage; at leaſt Botany-Bay gum forms a thicker mucilage than Eaſt-India gum, and this, than Gum Arabic.

Medical uſe.—It poſſeſſes the powers of a mucilaginous demulcent, in a high degree; and is frequently exhibited in diarrhœa, dyſentery, chincough, hoarſeneſs, ſtrangury, &c.; and is an extremely uſeful article for giving form to ſome remedies, and for correcting the acrimony of others.

Off. prep.—Mucilago, *Ed. Lond. Dub.* Emulſio, *Ed.* Emulſio Arabica, *Dub.* Miſt. moſchata, *Lond.* Miſtura cretacea, *Lond. Dub.* Decoct. cornu cervi, *Lond.* Trochiſci carbonatis calcis, *Ed.* Trochiſci glycyrrh. *Ed.* Troch. gly. cum opio, *Ed.* Trochiſci gummos, *Ed. Dub.* Pulv. cretæ comp. *Lond.* Pulv. trag. comp. *Lond.*

MOMORDICA ELATERIUM. *Ed.* *Cucumis Agreſtis. Lond. Dub.*

Monoecia Syngeneſia.—Nat. ord. *Cucurbitaceæ.*

Wild cucumber.

Off.—Fructus recens ſubmaturus. The freſh fruit, when almoſt ripe.

THIS plant is a native of the ſouth of Europe, and is perennial. When cultivated in this country, it does not ſurvive the winter. The fruit is oblong, about an inch and a half long, and an inch in diameter. It is of a green colour, and beſet with ſtiff hairs. When nearly ripe, it burſts on a ſlight touch, ſeparates from its ſtalk, and ſheds its ſeeds with great violence. From this circumſtance it was named by the Greeks *Elaterium*, which name was alſo applied to the fæcula of the juice of the fruit, the only preparation uſed in medicine.

Medical uſe.—In a few grains it operates as a draſtic purgative, and is ſometimes uſed in dropſies.

Off. prep.—Succus ſpiſſat. *Ed. Lond.*

MORUS NIGRA. *Morus. Lond.*

Monoecia Tetrandria.—Nat. ord. *Scabridæ.*

Mulberry.

Off.—Fructus. The fruit.

THIS tree, which is ſuppoſed to have come originally from Perſia, bears the cold of our winters, and ripens its fruit in England. The fruit has the ſame properties with other ſub-acid fruits. Its juice contains tartaric acid.

Off. prep.—Syr. ſucc. fruct. mori, *Lond.*

MOSCHUS MOSCHIFERUS. *Ed.*

The muſk deer. Muſk.

Off.—Materia in folliculo prope umbilicum collecta, *Moſchus* dicta, *Ed.* Moſchus, *Lond. Dub.* The ſubſtance contained in a follicle ſituated near the navel.

Mammalia.

THE muſk animal is an inhabitant of the moſt elevated region of Aſia, particularly of the Altayan Alps, and the mountains which divide Thibet from China. It is a gentle and timid animal, and its chace is difficult and dangerous. Its general form reſembles the deer tribe, and it is about three feet in length. In the male, behind the navel and before the prepuce, there is ſituated an oval bag, flat on one ſide, and convex on the other, about three inches long and two broad, projecting about an inch, and having a ſmall open orifice, beſet with ſhort hairs, which is empty

in the young animal, but in the adult is filled with a ſecreted matter, known by the name of Muſk. When the bag becomes too full, the animal expreſſes part of its contents, by rubbing itſelf againſt ſtones or trees. The muſk expreſſed in this manner is ſaid to be the pureſt, but none of it probably reaches this country. The beſt muſk is brought from Tonquin, an inferior ſort from Agria and Bengal, and a ſtill worſe from Ruſſia.

Fine muſk comes to us in round thin bladders, which are generally about the ſize of a pigeon's egg, covered with ſhort brown hairs, lined with a thin brown membrane, well filled, and without any appearance of having been opened. The muſk itſelf is dry, with a kind of unctuoſity, of a dark-reddiſh brown, or ruſty blackiſh colour, in ſmall round grains, with very few hard black clots, and perfectly free from ſandy, or other viſible foreign matter. If chewed, and rubbed with a knife on paper, it looks ſmooth, bright, yellowiſh, and is free from grittineſs. Laid on a red-hot iron it catches flame, and burns almoſt entirely away, leaving only an exceedingly ſmall quantity of light greyiſh aſhes. The largeſt and fulleſt bag ſcarcely contains more than two drachms of muſk.

Its taſte is ſomewhat bitteriſh, and its ſmell extremely powerful and peculiar. Neumann got from 30 grains of muſk 12 of watery, and 4 of alcoholic extract; and inverſely, 10 of alcoholic, and 6 of watery. Its ſmell and taſte were elevated in diſtillation with water, but not with alcohol. Neither the fixed nor volatile oils diſſolved it.

The very great price of muſk has given riſe to many modes of adulterating it. To increaſe its weight, ſand, and even particles of lead, are introduced through very ſmall openings into the bags. The real muſk is frequently abſtracted from the bag, and its place ſupplied with dry and coarſely powdered blood, or ſome mixture with aſphaltum. Theſe adulterations are to be detected by diſcovering that the bag has been opened. The preſence of blood is alſo known by the fetid ſmell it emits when heated ſufficiently, and by the formation of ammonia, when rubbed with potaſs. Aſphaltum is known by its ſhining fracture, and melting on hot iron, while muſk is converted into charcoal. But there are even artificial bags filled with a compoſition containing ſome real muſk. Theſe are in general thicker, and covered with longer hair, and want the internal brown membrane which lines the real muſk-bag.

Medical uſe.—Muſk is a medicine of very great efficacy, and for which, in ſome caſes, there is hardly any ſubſtitute. When properly adminiſtered, it ſometimes ſucceeds in the moſt deſperate circumſtances. It raiſes the pulſe, without heating much;

it allays ſpaſms, and operates remarkably on the brain, increaſing the powers of thought, ſenſation, and voluntary motion.

It may be employed in every inſtance of typhous fever, eſpecially when attended with delirium, or ſpaſmodic affection of any particular organ, or of the whole ſyſtem, or ſubſultus tendinum, &c. It is alſo uſed with the greateſt benefit in exanthematous and phlegmonic diſeaſes, accompanied with typhoid fever; and in many ſpaſmodic affections, as chincough, epilepſy, triſmus, &c.

It is moſt conveniently given in ſubſtance in powder, in doſes of three grains or upwards, repeated every one or two hours. Its beſt preparation is the tincture.

Off. prep.—Tinctura, *Dub.* Miſt. moſch. *Lond.*

MURIAS.

Muriate is the generic term for thoſe ſecondary compounds which contain muriatic acid. Their general properties have been already mentioned.

The muriates may be divided into three families:

1. Alkaline muriates,—ſoluble in water, fuſible and vaporizable without decompoſition, forming no precipitate with alkaline carbonates.

2. Earthy muriates,—ſoluble in water in general, decompoſable by heat, forming a white precipitate with alkaline carbonates.

3. Metalline muriates.—The muriatic acid is capable of combining with many metals, in two ſtates of oxidizement. The muriates which contain the metal in the ſtate of protoxide, are in general very acrid, and ſoluble both in water and alcohol. The muriates which contain the metal in the ſtate of peroxide are often inſoluble, have a white colour, and contain an exceſs of baſe, or are ſub-muriates. The muriates are alſo the moſt volatile metalline ſalts, and often riſe undecompoſed in ſublimation or diſtillation.

MURIAS AMMONIÆ. *Ed.* *Sal Ammoniacus. Lond. Dub.* *Ammonia Muriata.*

Muriate of ammonia. Sal ammoniac.

Muriate of ammonia is found native, eſpecially in the neighbourhood of volcanoes. It was firſt prepared in Egypt from the ſoot of camel-dung by ſublimation: but the greateſt part of that now uſed is manufactured in Europe; either by combining directly ammonia with muriatic acid, or by decompoſing the ſulphate of ammonia, by means of muriate of ſoda; or the muriates of lime and magneſia, by means of ammonia.

In commerce, muriate of ammonia occurs, either ſublimed, in firm, round, elaſtic, concavo-convex cakes, or cryſtallized, in

conical maſſes. The latter commonly contain other ſalts, eſpecially muriate of lime, which renders them deliqueſcent; and therefore the ſublimed muriate of ammonia is to be preferred for the purpoſes of medicine.

Muriate of ammonia has an acrid, pungent, urinous taſte. It is ſoluble in about three times its weight of water, at 60°, and in an equal weight, at 212°. During its ſolution, it produces 32° of cold. It is alſo ſoluble in about 4.5 parts of alcohol. It is permanent in the ordinary ſtate of the atmoſphere. By a gentle heat, it may be deprived of its water of cryſtallization, and reduced to the form of a white powder. At a higher temperature it ſublimes unchanged. Its cryſtals are either ſix-ſided pyramids, aggregated in a plumoſe form, or ſtill more commonly, four-ſided pyramids. It conſiſts of 42.75 muriatic acid, 25.00 ammonia, and 32.25 water. It is decompoſed by the ſulphuric and nitric acids; by baryta, potaſs, ſoda, ſtrontia, and lime; by ſeveral ſecondary ſalts containing theſe acids or baſes; and by thoſe metalline ſalts whoſe baſes form with muriatic acid an inſoluble compound.

Medical uſe.—Muriate of ammonia is now ſeldom uſed internally. It was formerly ſuppoſed to be a powerful aperient and attenuant of viſcid humours.

Externally applied, it is a valuable remedy. It may act in two ways,

1. By the cold produced during its ſolution.

It is from this cauſe that fomentations of muriate of ammonia probably prove benencial in mania, apoplexy from plethora, leſions of the head, and in violent headachs. When uſed with this intention, the ſolution ſhould be applied as ſoon as it is made.

2. By the ſtimulus of the ſalt.

On this principle we may explain its action as a diſcutient, in indolent tumours of all kinds, contuſions, gangrene, pſora, ophthalmia, cynanche, and in ſtimulating clyſters. In ſome caſes, as in chilblains, and other indolent inflammations, both modes of action may be ſerviceable. When firſt applied, the coldneſs of the ſolution will diminiſh the ſenſe of heat and uneaſineſs of the part, and the ſubſequent ſtimulus will excite a more healthy action in the veſſels.

Off. prep.—Aqua ammon. *Ed. Lond. Dub.* Alcohol ammon. *Ed. Lond. Dub.* Carbonas ammon. *Ed. Lond. Dub.* Aqua carb. ammon. *Ed Lond. Dub.* Liquor cupri ammoniat. *Lond. Dub.* Murias am m niæ et ferri, *Ed. Lond.* Calx hyd. alba, *Lond.* Spiritus am. fœtid. *Lond.*

MURIAS SODÆ. *Ed.* *Sal Muriaticus. Lond.* *Sal Communis. Dub.* *Soda Muriata.* *Sal Marinus.*

Muriate of ſoda. Common ſea-ſalt.

This is the moſt common of all the neutral ſalts. It is not only found in immenſe maſſes on and under the earth's ſurface, and contained in great quantities in many ſalt ſprings, but it is the cauſe of the ſaltneſs of the ſea.

Native muriate of ſoda preſents two varieties, the lamellar and fibrous. It is found in Poland, Hungary, Spain, England, &c. When not perfectly pure, it is purified by ſolution and cryſtallization.

Salt ſprings occur in many parts of the world. The quantity of muriate of ſoda contained in theſe varies, from an inconſiderable quantity even up to one third.

Sea-water alſo varies much in ſtrength. It is ſaid to contain moſt ſalt in warm climates, and at great depths.

Muriate of ſoda, as obtained from theſe natural ſolutions of it by evaporation and cryſtallization, is ſeldom pure, but commonly mixed with earthy muriates, which, being deliqueſcent ſalts, diſpoſe it to attract moiſture from the atmoſphere. It may, however, be purified, by precipitating the earths, by means of carbonate of ſoda, or by waſhing the cryſtallized ſalt with a ſaturated ſolution of muriate of ſoda, heated to ebullition. In this ſtate it is not capable of diſſolving any more muriate of ſoda, but will diſſolve a conſiderable quantity of the earthy muriates.

Muriate of ſoda has a pure ſalt taſte, is ſoluble in 2.8 times its weight of water at 60°, and in 2.76 at 212°. It is not ſoluble in alcohol. By the action of heat it firſt decrepitates, then melts, and laſtly, ſublimes without decompoſition. The primitive form of its cryſtals is cubic, and they are permanent in the atmoſphere. According to Kirwan, they conſiſt of 38.88 muriatic acid, 53 ſoda, and 8.12 water. It is decompoſed by the ſulphuric and nitric acids, by potaſs and baryta, by ſecondary ſalts containing theſe, and by metalline ſalts whoſe baſe forms an inſoluble compound with muriatic acid; it is alſo gradually decompoſed by lime, iron, and litharge.

Med. uſe.—Muriate of ſoda is one of the moſt important articles in the arts, and in domeſtic economy. As a medicine, it is uſeful in ſome caſes of dyſpepſia; and in large doſes it is ſaid to check vomiting of blood. It is a common ingredient in ſtimulating clyſters, and is ſometimes applied externally, as a fomentation to bruiſes, or in the form of bath, as a gentle ſtimulus to the whole ſurface of the body.

Off. prep.—Murias ſodæ exſiccat. *Ed. Dub.* Acid muriat. *Ed.*

Lond. Dub. Murias antim. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.*

MYRISTICA MOSCHATA. *Ed.* *Myriſtica. Lond. Dub.*
Monoecia Monandria.—Nat. ord. *Oleraceæ.*
The nutmeg-tree.

Off.—Fructus nucleus, *Nux moſchata* dictus; ejuſque oleum expreſſum, *Oleum macis* dictum; necnon oleum nucis volatile; denique, nucis involucrum. The kernel of the fruit commonly called Nutmeg; its eſſential oil; its expreſſed oil, called Oil of Mace; the involucrum of the nut, called Mace.

THE tree which furniſhes this elegant ſpice is a native of the Molucca iſlands. It is not, however, cultivated in any of them except Banda, from which all Europe has been hitherto ſupplied with mace and nutmeg. The entire fruit is about the ſize of a peach, and is marked with a longitudinal furrow. The external covering is ſmooth, fleſhy, and bitter. As the fruit ripens, this burſts, and diſcloſes the mace, which is an oily membranous pulp, of a dark-red colour, and aromatic flavour, divided into narrow branched ſlips. Within the mace is incloſed the nut, which conſiſts of a brown, thin, hard ſhell, and a fat perenchymatous kernel, of an oval ſhape. The fruit is gathered three times a-year. The external covering is ſeparated on the ſpot, and the mace and nut carried home, where they are carefully dried in the ſun. After they are dried, the nutmegs are dipt in lime water, and the mace is ſprinkled with ſalt water, probably to preſerve them from the attacks of inſects.

Mace, by drying, acquires a reddiſh-yellow colour. When good, it is flexible, thin, oily, of a deep colour, has a ſtrong, agreeable ſmell, and an aromatic, bitteriſh acrid taſte. When brittle, divided into fewer ſlips, of a whitiſh, or pale yellow colour, and of little ſmell or taſte, it is to be rejected.

Neumann got from 7680 parts of mace, 2160 alcoholic, and 1200 watery extract; and inverſely, 1920 watery, and 1440 alcoholic extract, with 300 of volatile oil heavier than water, which aroſe during the inſpiſſation of the watery extract. The expreſſed oil of mace is leſs conſiſtent than that of nutmegs.

Nutmegs are oval, flattened at both ends, of a grey-brown colour, and reticularly furrowed on the outſide, of a yellow colour within, variegated with brown undulating lines, ſolid, hard, unctuous to the feel, and eaſily cut with a knife; and have a balſamic ſmell, and agreeable aromatic taſte. The ſmall round nutmegs are better than the large oval ones; and they ſhould have a ſtrong ſmell and taſte, and ſhould neither be worm-eaten, muſty, nor variegated with black lines. Their activity is, how-

ever, confined to the dark coloured veins, which are not apt to be worm-eaten.

Neumann got from 1920 parts of nutmeg, 480 of an oily alcoholic extract, and 280 watery, with 320 fixed oil: these two last were both insipid: and inversely, 600 watery extract, with 50 of fixed oil, which rose to the surface during the inspissation, and 10 of volatile oil which distilled over; and afterwards, 120 unctuous alcoholic extract, and 300 more of fixed oil. By expression 1920 gave 540 of oil, and afterwards 480 of watery extract, a pretty strongly tasted distilled water, and 80 unctuous alcoholic extract, with 60 of insipid fixed oil.

Off. prep.—Spirit. nucis moschat. *Ed. Lond. Dub.* Spirit. lav. comp. *Ed. Lond. Dub.* Pulv. carb. calcis comp. *Ed.* Confectio aromat. *Dub. Lond.* Elect. catechu, *Ed. Dub.* Trochisci carb. calcis, *Ed.*

Volatile oil of nutmeg. By distillation they yield a considerable quantity of essential oil, of a whitish yellow colour, lighter than water, and possessing the aromatic taste and smell in an eminent degree. In doses of a few drops, it is a powerful carminative and stomachic.

Off. prep.—Spirit. alk. volat. aromat.

Expressed oil of mace. Nutmegs also yield by expression a considerable quantity of limpid yellow oil, which, on cooling, concretes into a sebaceous consistence. They are previously beaten to a soft paste in a warm mortar, then inclosed in a linen bag, exposed to the vapour of hot water, and squeezed in a press, of which the plates have been heated.

It is a mixture of the volatile oil on which their flavour depends, and of a fixed oil, of a white colour, without taste or smell; and as the properties which characterize it depend on the presence of the volatile oil, the denomination of Fixed oil, applied to it by the Edinburgh college, is less correct than that of Expressed oil, given to it by the other colleges, from the manner of its preparation.

In the shops we meet with three sorts of unctuous substances called Oil of mace; though really expressed from the nutmeg. The best is brought from the East Indies, in stone jars; this is of a thick consistence, of the colour of mace, and an agreeable fragrant smell. The second sort, which is paler coloured, and much inferior in quality, comes from Holland, in solid masses, generally flat, and of a square figure. The third, which is the worst of all, and usually called Common oil of mace, is an artificial composition of suet, palm oil, and the like, flavoured with a little genuine oil of nutmeg. 7680 of the second sort yielded to Neumann 330 volatile oil heavier than water, 2880 of fluid express-

ible oil, and 4560 of ſolid, but fuſible, ſebaceous matter, perfectly inſipid, inodorous, and of a chalky whiteneſs.

Off. prep.—Emp. lad. comp. *Lond.*

Medical uſe.—Both mace and nutmegs are rather to be conſidered as aromatic ſpices, than as articles of medicine. From the eſſential oil they contain, they are heating and ſtimulating; and they are added to other medicines for the ſake of their agreeable flavour.

MYROXYLON PERUIFERUM. *Ed.*

Willd. g. 829, *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Sweet-ſmelling balſam tree.

Off.—Balſamum; Balſamum Peruvianum. *Lond. Dub.* Peruvian balſam.

THIS tree grows in the warmeſt provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with reſinous juice, even the leaves are full of tranſparent reſinous points, like thoſe of the orange tree.

The balſam, as brought to us, is commonly of the conſiſtence of thin honey, of a reddiſh-brown colour, inclining to black, an agreeable aromatic ſmell, and a very hot biting taſte.

It is very often adulterated; and ſometimes what is ſold for Peruvian balſam, is a ſpurious mixture of reſin and eſſential oil, flavoured with benzoin. Theſe frauds are not eaſily detected, and fortunately they are of little importance.

It is ſaid to be obtained by boiling the cuttings of the twigs in water, and ſkimming off with a ſpoon the balſam, which ſwims on the top.

By inciſion this tree yields a much more fragrant white or colourleſs balſam, which, when inſpiſſated by the heat of the ſun, forms the red or dry balſam of Peru; but it is very rarely in uſe in Britain, and almoſt never to be met with in our ſhops.

Peruvian balſam conſiſts of a volatile oil, reſin, and benzoic acid; it is, accordingly, entirely ſoluble in alcohol, and in eſſential oils. Water diſſolves part of the benzoic acid, and fixed oil combines with the reſin. It may be ſuſpended in water, by trituration with mucilage and yolk of egg.

Med. uſe.—Balſam of Peru is a very warm aromatic medicine, conſiderably hotter and more acrid than copaiva. Its principal effects are, to warm the habit, and to ſtrengthen the nervous ſyſtem. Hence its uſe in ſome kinds of aſthmas, gonorrhœas, dyſenteries, ſuppreſſions of the uterine diſcharges, and other diſorders proceeding from a debility of the ſolids. It is alſo employed

externally, for cleanfing and healing wounds and ulcers, and fometimes againft palfies and rheumatic pains.

Off. prep.—Tinctura, *Lond.* Troch. glyc. comp. *Dub.*

MYRRHA. *Ed. Lond. Dub.*

Myrrh.

Off.—Gumma-refina. The gum-refin.

THE tree which produces this gum-refin is not yet afcertained. Mr. Bruce has given fome reafons for fuppofing that it is a mimofa; but we may obferve, that all the mimofas with which we are fufficiently acquainted furnifh a pure gum, and not a gum-refin. The beft myrrh is brought from Troglodytitia, a province of Abyffinia, on the borders of the Red fea; but what we receive comes from the Eaft Indies, and is produced on the eaftern coaft of Arabia Felix.

The beft myrrh is in the form of tears. It fhould be of a yellow, or reddifh-yellow colour, becoming redder when breathed on; light, brittle, of an unctuous feel, pellucid, fhining; prefenting white femi-circular ftriæ in its fracture; of a very bitter aromatic tafte, and a ftrong, peculiar, not unpleafant odour. It is not good if whitifh, dark-coloured, black, refinous, ill-fmelled, or mixed with impurities, which is too commonly the cafe.

Neumann afcertained that water and alcohol are both of them capable of taking up the whole of the tafte and fmell of the myrrh, the extract made by either after the other being infipid. The alcohol diftilled from the tincture elevated none of the flavour of the myrrh; but during the infpiffation of the decoction a volatile oil arofe, containing the whole of the flavour of the myrrh, and heavier than water, while the extract was merely bitter. From 7680 parts of myrrh he got 6000 watery extract, 180 volatile oil, and 720 alcoholic; and inverfely, 2400 alcoholic, and 4200 watery. I have obferved that the tincture is tranfparent, and when poured into water, forms a yellow opaque fluid, but lets fall no precipitate, while the watery folution is always yellow and opaque; and that myrrh is not fufible, and is difficultly inflammable. Mr. Hatchett found it foluble in alkalies.

Med. ufe.—Myrrh is a heating ftimulating medicine. It frequently occafions a mild diaphorefis, and promotes the fluid fecretions in general. Hence it proves ferviceable in cachectic difeafes, arifing from inactivity of the fyftem, and is fuppofed to act efpecially upon the uterine fyftem, and to refift putrefaction.

It is exhibited,

1. In fubftance; in the form of powder, or made up into pills, in dofes of 10 to 60 grains.

2. Diſſolved in water, as in Griffiths' famous, but unchemical, myrrh mixture.
3. Diſſolved in alcohol.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. aloes æther. *Ed.* Tinctura aloes cum myrrha, *Ed. Lond.* Pulv. myrrhæ comp. *Lond.* Pulv. aloes cum ferro, *Lond.* Pil. galb. comp. *Lond.* Pil. rhœi comp. *Ed.* Pil. aloes cum myrrha, *Lond. Ed.* Pil. aſſæ fœt. comp. *Ed.*

MYRTUS PIMENTA. *Ed.* *Pimento. Lond. Dub.*
Willd. g. 973, *ſp.* 28. *Icoſandria Monogynia.*—Nat. ord. *Heſperideæ.*

Pimento tree.

Off.—Fructus, vulgo Piper Jamaicenſe. The fruit, commonly called Jamaica Pepper.

THIS is a native of Jamaica, and grows in all the woodlands on the north ſide. Soon after the trees have bloſſomed, the berries become fit for gathering; the fruit not being ſuffered to ripen, as in that ſtate it is moiſt and glutinous, and therefore difficult to cure, and when dried becomes black and taſteleſs. The berries are dried by ſpreading them on a terrace, expoſed to the ſun for about ſeven days, during which time they gradually loſe their green colour, and become of a reddiſh-brown.

The ſmell of this ſpice reſembles a mixture of cinnamon, cloves, and nutmegs; its taſte approaches to that of cloves, or a mixture of the three foregoing; whence it has received the name of *allſpice.*

Neumann aſcertained that its flavour reſides entirely in a volatile oil heavier than water, and its pungency in a reſin or a ſubſtance ſoluble in alcohol and inſoluble in water. From 480 parts he got 120 watery extract, 30 volatile oil, and 20 alcoholic extract; and inverſely, 66 alcoholic and 100 watery.

Med. uſe.—Pimento is a warm aromatic ſtimulant, and is much uſed as a condiment in dreſſing food. As a medicine, it may be advantageouſly ſubſtituted for the more coſtly ſpices, eſpecially in hoſpital practice.

Off. prep.—Aq. deſtil. *Ed. Lond.* Ol. volat. *Ed.* Spirit. *Ed. Lond. Dub.* Syr. ſpin. cerv. *Lond.* Pil. opii, *Ed.*

NICOTIANA TABACUM. *Ed.* *Nicotiana. Lond. Dub.*
Willd. g. 379, *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

Tobacco.

Off.—Folium. The leaves.

This is an annual plant, a native of America, from whence it was firſt brought into Europe, about the year 1560. It is now ſometimes cultivated for medicinal uſe in our gardens; but in general it is imported from America in large quantities. The leaves are about two feet long, of a pale green colour whilſt freſh, and when carefully dried of a lively yellowiſh caſt. They have a ſtrong, diſagreeable, narcotic ſmell, and a very acrid burning taſte.

The active conſtituent of tobacco is an eſſential oil; for, by long boiling, the decoction and extract of tobacco become almoſt inert; and, by diſtillation an oil is obtained from it, ſo active, that ſmall animals are almoſt inſtantly killed, when wounded by a needle dipped in it.

Medical uſe.—On the living body, whether taken into the ſtomach in ſubſtance or ſolution, or into the lungs in the form of ſmoke, or applied to abraded ſurfaces, tobacco is capable of producing deleterious effects. It often proves virulently cathartic or emetic, and occaſions intolerable cardialgia, anxiety, and vertigo.

The ſyſtem becomes eaſily habituated to the action of tobacco; and many people uſe very large quantities of it in ſeveral ways as a luxury, without experiencing any other bad effect than what ariſes from their being unable to relinquiſh it after the habit is confirmed.

As a medicine it is exhibited in various forms:

1. In ſubſtance. When chewed, it cauſes an increaſed flow of ſaliva, and ſometimes relieves the toothach; and reduced to powder, it proves an excellent errhine and ſternutatory, when ſnuffed up the noſtrils.
2. In infuſion in water or wine. Taken in ſuch ſmall doſes as to have little effect on the ſtomach, it proves powerfully diuretic, and was employed by Dr. Fowler with very great ſucceſs in caſes of dropſy and dyſuria. It is alſo applied externally for the cure of pſora, tinea, and other cutaneous diſeaſes.
3. In the form of ſmoke, it is injected into the anus by means of bellows of a peculiar conſtruction. By acting as a ſtimulus to the rectum, it ſometimes ſucceeds in reviving the vital powers in ſome kinds of aſphyxia, and in evacuating the inteſtines in caſes of obſtinate conſtipation.

Off. prep.—Vin. nicot. tabac. *Ed.*

NITRAS.

Nitrate is the generic term for ſecondary compounds, which conſiſt of nitric acid, combined with any baſe. Their general characters have been already mentioned. There are three families of nitrates.

1. Alkaline nitrates;—ſoluble in water; ſolubility increaſed by increaſe of temperature; cryſtallizable; forming no precipitate with alkaline carbonates.

2. Earthy nitrates;—ſoluble in water; forming a white precipitate with alkaline carbonates.

3. Metallic nitrates;—generally ſoluble, both in water and in alcohol; decompoſable by heat, furniſhing nitric oxide gas, and leaving the metal oxidized to a maximum.

NITRAS POTASSÆ. *Ed. Lond. Dub.*
Nitrate of potaſs.
Off.—Nitrum. Nitre.

NITRATE of potaſs is annually produced on the ſurface of the earth in many countries. For this production, the preſence of a calcareous baſe, heat, and an open, but not too free, communication with dry atmoſpheric air, are requiſite. The putrefaction of organic, eſpecially animal ſubſtances, is not neceſſary to, but accelerates the formation of, this ſalt, by affording the azote in a ſtate in which it combines readily with the oxygen of the atmoſphere, and forms the nitric acid. Accordingly, in Germany and France, nitrate of potaſs is prepared, by expoſing mixtures of putrefying animal and vegetable ſubſtances, and calcareous earths, to the action of the atmoſphere. The ſalt is afterwards extracted by lixiviation and cryſtallization. The nitre uſed in this country is chiefly imported from the Eaſt Indies. As it occurs in commerce, it often contains a little muriate of potaſs and muriate of ſoda, from which it is eaſily purified by diſſolving it in boiling water, and filtering it; on cooling, the nitrate of potaſs cryſtallizes, and the other ſalts remain diſſolved.

Nitrate of potaſs has a ſharp, bitteriſh, cooling taſte. It ſhoots in pretty large cryſtals, which are generally ſix-ſided priſms, terminated by ſix ſided pyramids; very brittle, and permanent in the atmoſphere; ſoluble in ſeven times their weight of water at 60°, and in an equal weight at 212°; melting when expoſed to a ſtrong heat, giving out at firſt oxygen, and afterwards nitrogen gas, until the whole acid be decompoſed, and the potaſs alone remain behind. It deflagrates more or leſs violently with all oxygenizable ſubſtances, oxidizing or acidifying them. When dried in a temperature of 70°, it conſiſts, according to Kirwan, of 44 nitric acid, 51.8 potaſs, and 4.2 water. It is decompoſed by the ſulphuric acid and baryta, by the muriate and acetite of baryta, and the ſulphates of ſoda, ammonia, magneſia, and alumina.

Medical uſe.—Taken to the extent of from a drachm to half an ounce in the courſe of a day, in repeated doſes, it diminiſhes the heat of the body, and the frequency of the pulſe, operates by ſtool, and acts upon the ſecretion of urine, but is apt to produce

pains in the ſtomach. In large doſes, ſuch as an ounce, taken at one time, it produces the moſt dreadful ſymptoms, conſtant vomiting, purging, mixed with blood, convulſions and death. Accidents of this kind have happened from its being ſold by miſtake for ſulphate of ſoda.

It is beſt given in ſmall doſes, as five to ten grains frequently repeated, and is only admiſſible in inflammatory diſeaſes. Externally it is uſed in gargles, for inflammatory ſore throats.

Off. prep.—Acid. nitr. *Lond. Ed. Dub.* Nitr. purif. *Lond.* Sulphas pot. cum ſulph. *Ed.* Antim. calc. *Lond.* Oxid. ant. cum ſulph. per nitrat. pot. *Ed. Lond. Dub.* Trochiſci nitri, *Ed. Lond.*

OLEA EUROPÆA. *Ed.* *Oliva.* *Lond. Dub.*
Willd. g. 36, *ſp.* 1. *Diandria Monogynia.*—Nat. ord. *Sepiariæ.*
The olive tree.

Off.—Fructus, ejuſque oleum expreſſum. The fruit and oil expreſſed from the fruit.

THIS tree is a native of the ſouth of Europe and north of Africa. It is cultivated in France, Spain, and Italy, for the ſake of its fruit and the oil expreſſed from it. Olives, when freſh, have an acrid, bitter, extremely diſagreeable, taſte; but they are only eaten when pickled. They are firſt ſteeped for ſeveral days in a ley of wood-aſhes, and then pickled in a ſtrong ſolution of muriate of ſoda.

They are principally valued for the oil they afford by expreſſion. For this purpoſe they are gathered when fully ripe, and immediately bruiſed and ſubjected to the preſs. The fineſt oil flows firſt, and a very bad oil is obtained by boiling the magma, which remains after expreſſion, in water. According to Beaumé, they are gathered when ſufficiently ripe. They are then dried, to deprive the mucilage, of which they contain a large quantity, of its water, and are expreſſed after being bruiſed, and moiſtened with a little water to render the oil more fluid. By reſt, the mucilage and water which may have paſſed with it, ſeparate. It is ſometimes mixed with oil of poppy ſeeds; but, by expoſing the mixture to the freezing temperature, the olive oil freezes, while that of the poppies remain fluid; and as oils which freeze with moſt difficulty are moſt apt to become rancid, olive is deteriorated by the admixture of poppy oil.

Good olive oil ſhould have a pale yellow colour, ſomewhat inclining to green, a bland taſte, without any rancidity, and no ſmell, and ſhould congeal at 38° Fahrenheit. In this country it is frequently rancid, and ſometimes adulterated.

Medical uſe.—Taken internally, it operates as a gentle laxative, and is given in caſes of worms. It is alſo given in large quantities to mitigate the action of acrid ſubſtances taken into the ſto-

mach. It is uſed externally in frictions, in gargles, and in clyſters; but its principal employment is for the compoſition of ointments and plaſters.

Off. prep.—Oleum ammoniat. *Ed. Lond.* Oleum camph. *Ed.* Oleum ſulph. *Ed. Lond.* Linim. ſimp. *Ed.* Unguent. ſimp. *Ed.* Unguent. ſper. ceti, *Lond. Dub.* Unguentum ceræ, *Lond. Dub.* Cerat. ſimp. *Ed.* Cer. ſper. ceti, *Lond. Dub.* Unguent. reſin. flavæ, *Lond. Dub.* Unguent. elemi, *Lond. Dub.* Unguent. ſambuci, *Lond. Dub.* Emplaſt. oxidi plumbi ſemivitrei, *Ed. Lond. Dub.* Ceratum ſaponis, *Lond. Dub.* Ung. ceruſſ. acet. *Lond. Dub.* U. lith. acetat. *Lond. Dub.* Emplaſt. hyd. *Ed.* Cerat. lap. cal. *Lond. Dub.* Emplaſt. oxidi ferri rubri, *Ed.*

ONISCUS ASELUS. *Millepeda. Lond.*

Inſecta aptera.

Slaters killed by the vapour of alcohol.

THESE inſects are found in cellars, under ſtones, and in cold moiſt places; in warm countries they are rarely met with. They have a faint diſagreeable ſmell, and a ſomewhat pungent, ſweetiſh, nauſeous taſte.

Neumann got from 480 parts 95 watery, and ten alcoholic extract: and inverſely 52 alcoholic, and 45 watery. Nothing roſe in diſtillation with either.

Their medical virtues have been very much over rated.

Off. prep.—Millepedæ ppt. *Lond. Dub.*

ORIGANUM.

Willd. g. 1116. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Sp. 10. ORIGANUM VULGARE. *Origanum. Lond. Dub.*

Wild marjoram.

Off.—Herba. The herb.

THIS is a perennial plant, and is met with upon dry chalky hills, and in gravelly ſoils, in ſeveral parts of Britain. It has an agreeable ſmell, and a pungent taſte, warmer than that of the garden marjoram, and much reſembling thyme, with which it ſeems to agree in virtue. An eſſential oil diſtilled from it is kept in the ſhops, and is very acrid.

Off. prep.—Ol. volat. *Lond. Dub.*

Sp. 15. ORIGANUM MAJORANA. *Ed. Majorana. Lond. Dub.*

Sweet marjoram.

Off.—Herba. The plant.

SWEET marjoram is an annual plant, which grows wild in Portugal, but is cultivated in our gardens, principally for culinary pur-

poſes. It is a moderately warm aromatic, yielding its virtues both to aqueous and ſpiritous liquors by infuſion, and to water in diſtillation.

Off. prep.—Pulv. aſari comp. *Ed. Lond. Dub.*

OSTREA EDULIS. *Oſtrea. Lond. Dub.*
Cl. *Vermes.* Ord. *Teſtacea.*
Oyſter.
Off.—Teſta. The ſhell.

THE oyſter is a very nutritious article of diet, and in ſome diſeaſes not only admiſſible, but even advantageous. Their ſhells, which are officinal, are compoſed, like all the mother-of-pearl ſhells, of alternate layers of carbonate of lime, and a thin membranaceous ſubſtance, which exactly reſembles coagulated albumen in all its properties. By burning, the membrane is deſtroyed, and they are converted into lime, which, although very pure, poſſeſſes no advantage over that of the mineral kingdom.

Off. prep.—Oſt. teſt. ppt. *Lond. Dub.*

OVIS ARIES. *Ed. Ovis. Lond. Dub.*
Cl. *Mammalia.* Ord. *Ruminantia.*
The ſheep.
Off.—Adeps. Mutton-ſuet.

MUTTON is a highly nutritious and wholeſome food. Ewe-milk is thick and heavy, and contains much cream and little whey. The cheeſe made from it has a bitter biting taſte, eſpecially when old, and is ſuppoſed to be ſtomachic. Mutton-ſuet is officinal, for the purpoſe of giving conſiſtency to ointments and plaſters.

Off. prep.—Sebum ppt. *Lond.* Emplaſt. ceræ. *Ed. Lond. Dub.* Ungt. elemi, *Lond. Dub.* Ungt. picis, *Lond. Dub.* Ungt. ſambuci, *Lond. Dub.* Emp. mel. veſic, *Ed.* Ungt. hydrarg. *Ed. Lond. Dub.*

OXALIS ACETOSELLA. *Lujula. Lond. Acetoſella. Dub.*
Willd. g. 918, *ſp.* 25. *Decandria Pentagynia.*—Nat. ord. *Gruinales.*
Wood-ſorrel.
Off.—Folium. The leaves.

THIS is a ſmall perennial plant, which grows wild in woods, and ſhady hedges. The leaves contain a conſiderable quantity of ſuper-oxalate of potaſs, and have an extremely pleaſant acid taſte. They poſſeſs the ſame powers with the vegetable acids in general, and may be given in infuſion, or beaten with ſugar into a conſerve, or boiled with milk to form an acid whey. The ſuper-oxalate of potaſs is extracted in large quantities from them, and ſold under the name of *Eſſential Salt of Lemons.*

Twenty pounds of the fresh leaves yielded to Neumann six pounds of juice, from which he got two ounces two drachms and a scruple of salt, besides two ounces and six drachms of an impure saline mass.

Off. prep.—Conserva, *Lond. Dub.*

PÆNEA SARCOCOLLA. *Sarcocolla. Lond.*

Willd. g. 218, *sp.* 1. *Tetrandria Monogynia.*—Nat. ord. *Conglomeratæ.*

Sarcocoll.

Off.—Gummi resina. A gum-resin.

The plant is a native of Ethiopia, and yields the sarcocoll by spontaneous exudation. The tears of sarcocoll are seldom so large as peas, and have either a pale red or yellowish white colour. They are extremely brittle, or rather friable, shining in their fracture, resembling a good deal gum-arabic in coarse powder, but rather more opaque. They have no smell, but a bitter taste, combined with a sweetness like that of liquorice. Neumann obtained from 480 parts, 360 of alcoholic, and afterwards 40 of watery extract, and inversely 450 watery, and 26 alcoholic. In distillation nothing arose. It is not fusible, and kindles with difficulty. Dr. Thomson considers sarcocoll as a peculiar vegetable principle, which he defines to be soluble in water and in alcohol, taste bitter sweet, and uncrystallizable. Manna, one of his species is, however, very crystallizable. Sarcocoll was supposed to possess peculiar virtues in agglutinating wounds.

Off. prep.—Pulv. cerussæ comp. *Lond.*

PANAX QUINQUEFOLIUM. *Ginseng. Lond.*

Polygamia Diœcia.—Nat. ord. *Hederaceæ.*

Ginseng.

Off.—Radix. The root.

This is a perennial plant, which grows in Tartary and North America. The root is about the thickness of the little finger; an inch or two in length, often dividing into two branches; of a whitish-yellow colour, wrinkled on the surface; of a compact, almost horny texture; when broken, exhibiting a resinous circle in the middle, of a reddish colour. It has no smell, but a very sweet taste, combined with a slight degree of aromatic bitterness.

The Chinese, probably on account of its scarcity, have a very extraordinary opinion of the virtues of this root, so that it sells for many times its weight of silver. The Americans, on the contrary, disregard it, because it is found plentifully in their woods. In fact, it is a gentle and agreeable stimulant.

PAPAVER.

Willd. g. 1015. *Polyandria Monogynia.*—Nat. ord. *Rhœades.*

Sp. 5. PAPAVER RHOEAS. *Papaver erraticum.* *Lond.*

Corn-roſe, or red poppy.

Off.—Flos. The flower.

THIS ſpecies of poppy is annual, and very common in our corn fields. The petals give out a fine red colour when infuſed, and are ſuppoſed to poſſeſs ſlightly anodyne properties.

Off. prep.—Syr. papav. erratici, *Lond.*

Sp. 7. PAPAVER SOMNIFERUM. *Ed.* *Papaver album.* *Lond. Dub.*

White poppy.

Off.—Capſula, ejuſque ſuccus ſpiſſatus, *Opium* dictus. The capſules and their inſpiſſated juice, commonly called Opium.

THE white poppy is alſo an annual, and is ſometimes found wild in this country, but it is probably originally a native of the warmer parts of Aſia.

In this country it is frequently cultivated for the beauty of the varieties of its flowers, and for its ſeeds. Some attempts have been made to obtain opium from its capſules; and Mr. Ball received a premium from the ſociety for encouraging the arts, for ſpecimens of Britiſh opium, in no reſpect inferior to the beſt eaſtern opium. But we apprehend that the climate of this country is an inſuperable obſtacle to its becoming a profitable branch of agriculture.

The leaves, ſtalks, and capſules, of the poppy, abound with a milky juice, which may be collected in conſiderable quantity by ſlightly wounding them when almoſt ripe: this juice, expoſed for a few days to the air, thickens into tenacious tears, which in fact is opium. Theſe are then worked up into maſſes, and covered with poppy or tobacco leaves. By decoction and expreſſion this juice is partially extracted, together with a conſiderable quantity of mucilage. The liquor ſtrongly preſſed out, ſuffered to ſettle, clarified with whites of eggs, and evaporated to a due conſiſtence, yields about one fifth, or one ſixth the weight of the heads, of extract. This poſſeſſes the virtues of opium in a very inferior degree; but it does not come to this country, unleſs when uſed to adulterate the genuine opium. A ſtrong decoction of the dried heads, mixed with as much ſugar as is ſufficient to reduce it into the conſiſtence of a ſyrup, becomes fit for keeping in a liquid form; and is the only officinal preparation of the poppy. It is, however, a very unequal preparation, as the real quantity of opium

it contains is very uncertain, and by no means equal to ſyrup, to which a certain quantity of ſolution of opium is added.

The ſeeds of the poppy are ſimply emulſive, and contain none of the narcotic principle. They yield a conſiderable quantity of fixed oil by expreſſion.

Two kinds of opium are found in commerce, diſtinguiſhed by the names of Turkey and Eaſt-India opium.

Turkey opium is a ſolid compact ſubſtance, poſſeſſing a conſiderable degree of tenacity; when broken, having a ſhining fracture and uniform appearance; of a dark brown colour; when moiſtened, marking on paper a light brown interrupted ſtreak, and becoming yellow when reduced to powder; ſcarcely colouring the ſaliva when chewed, exciting at firſt a nauſeous bitter taſte, which ſoon becomes acrid, with ſome degree of warmth; and having a peculiar heavy diſagreeable ſmell. The beſt is in flat pieces, and beſides the large leaves in which it is enveloped, is covered with the reddiſh capſules of a ſpecies of rumex, probably uſed in packing it. The round maſſes which have none of theſe capſules adhering to them, are evidently inferior in quality. It is bad if it be ſoft, or friable, mixed with any impurities, have an intenſely dark or blackiſh colour, a weak or empyreumatic ſmell, a ſweetiſh taſte, or draw upon paper a brown continuous ſtreak.

Eaſt-Indian opium has much leſs conſiſtence, being ſometimes not much thicker than tar, and always ductile. Its colour is much darker; its taſte more nauſeous, and leſs bitter; and, its ſmell rather empyreumatic. It is conſiderably cheaper than Turkiſh opium, and ſuppoſed of only half the ſtrength. One eighth of the weight of the cakes is allowed for the enormous quantity of leaves with which they are enveloped. In the Eaſt Indies, when opium is not good enough to bring a certain price, it is deſtroyed under the inſpection of officers.

Opium is not fuſible, but is ſoftened even by the heat of the fingers. It is highly inflammable. It is partially ſoluble, both in alcohol and in water. Neumann got from 1920 parts of opium, 1520 alcoholic, and afterwards 80 watery extract, 320 remaining undiſſolved; and inverſely 1280 watery, and 200 alcoholic extract, the reſiduum being 440.

The ſolutions of opium are tranſparent, and have a brown or vinous colour. The watery ſolution is not decompoſed by alcohol. A ſmall quantity of matter, which, as far as my experiments go, is neither fuſible nor remarkably inflammable, is ſeparated from the alcoholic ſolution by water. I have alſo obſerved that the watery ſolution of opium or the alcoholic, after it has been precipitated by water, does not redden vegetable blues, is not precipitated by acids or alkalies, but is precipitated copiouſly by carbonate of potaſs, muriate and ſuper-nitrate of mercury, oxymuriate of tin, ſulphate

of copper, ſulphate of zinc, acetate of lead, nitrate of ſilver, and red ſulphate of iron. The precipitate in the laſt caſe was dirty brown, not reſembling thoſe by alkaline or aſtringent ſubſtances. The ſolutions of opium, eſpecially the watery, are alſo copiouſly precipitated by infuſion of galls. This precipitate ſeems to reſemble that produced by cinchonin, and to be different from that produced by gelatin.

Opium imparts its narcotic virtues by diſtillation to alcohol and to water, and they are alſo diminiſhed, or entirely diſſipated, by long boiling, roaſting, or great age. The part of opium which is inſoluble either in water or in alcohol, is albumen, according to Gren; caoutchouc, according to Buchholtz; a virulent glutinous ſubſtance, according to Joſſe; and Prouſt ſays it contains wax. From experiments made ſome years ago, I concluded that it was perfectly ſimilar to the gluten of wheat flour, or fibrine. Long ago it was propoſed to ſeparate the reſinous parts of opium by the ſame proceſs that the fibrine of wheat flour is obtained. The fact is, that if Turkey opium be kneaded in a large quantity of water, the ſoluble parts are removed, and there remains in the hand an adheſive plaſtic maſs, of a paler colour, not fuſible, but becoming ductile when immerſed in hot water, inflammable, imparting ſome colour to alcohol, but not ſoluble in it. Eaſt-India opium, treated in the ſame way, is entirely diſſolved or diffuſed in the water, and leaves no plaſtic maſs in the hand.

Upon the whole, it appears that the active conſtituent of opium, though not perfectly underſtood, is of a volatile nature, but ſomewhat fixed by its combination with the other conſtituents; that it is ſoluble both in water and in alcohol; that it is diſſipated in the proceſſes recommended for purifying opium by ſolution and evaporation; and that the attempts, made by ſome pharmaceutiſts, to obtain a preparation of opium, which ſhould poſſeſs only its ſedative, without its narcotic, effects, only ſucceeded in ſo far as they diminiſhed its activity.

By evaporating a watery ſolution of opium to the conſiſtence of a ſyrup, Deroſne obtained a precipitate, which was increaſed by diluting it with water. He diſſolved this in hot alcohol, from which it again ſeparated on cooling. When purified by repeated ſolutions it cryſtallized in rectangular priſms, with rhomboidal baſes, had no taſte or ſmell, was inſoluble in cold water, and ſoluble in 400 parts of boiling water, did not affect vegetable blues, was ſoluble in 24 parts boiling, and 110 cold, alcohol; ſoluble in hot ether and volatile oils, and ſeparated from them as they cooled; very ſoluble in all acids, and highly narcotic. Theſe obſervations are curious, and deſerve to be confirmed.

Medical uſe.—The action of opium on the living ſyſtem, has

been the ſubject of the keeneſt controverſy. Some have aſſerted that it is a direct ſedative, and that it produces no ſtimulant effects whatever, while others have aſſerted as ſtrongly, that it is a powerful, and highly diffuſible, ſtimulus, and that the ſedative effects, which it undeniably produces, are merely the conſequence of the previous excitement. The truth appears to be that opium is capable of producing a certain degree of excitement, while the ſedative effects which always ſucceed, are incomparably greater than could be produced by the preceding excitement. The ſtimulant effects are moſt apparent from ſmall doſes. Theſe increaſe the energy of the mind, the frequency of the pulſe, and the heat of the body, excite thirſt, render the mouth dry and parched, and diminiſh all the ſecretions and excretions, except the cuticular diſcharge, which they increaſe. Theſe effects are ſucceeded by languor and laſſitude. In larger doſes, the ſtimulant effects are not ſo apparent, but the power of all ſtimulating cauſes, ſuch as pain and fear, of making impreſſions on either the body or mind, is remarkably diminiſhed, and confuſion of head, vertigo, and ſleep, are produced. In exceſſive doſes it proves a violent narcotic poiſon, producing headach, vertigo, delirium, and convulſions, accompanied with a very ſlow pulſe, ſtertorous breathing, and a remarkable degree of inſenſibility or ſtupor, terminated by apoplectic death. In one caſe where I inſpected the body after death, the inner membrane of the ſtomach was remarkably corrugated, and with ſome inflammation; but as large doſes of ſulphate of zinc, and of flour of muſtard had been alſo taken, no inference can be drawn from theſe appearances. The bad effects of an over-doſe of opium are often prevented by vomiting when it is excited, and they are beſt counteracted by making the patient drink freely of acids and coffee, and not permitting him to yield to his deſire of ſleeping. By habit, the effects of opium on the body are remarkably diminiſhed. There have been inſtances of four grains proving fatal to adults, while others have been known to conſume as many drachms daily. The habitual uſe of opium produces the ſame effects with habitual dram drinking, tremors, paralyſis, ſtupidity, and general emaciation, and like it can ſcarcely ever be relinquiſhed.

In diſeaſe, it is chiefly employed to mitigate pain, diminiſh morbid ſenſibility, procure ſleep, allay inordinate actions, and to check diarrhœas and other exceſſive diſcharges. It is contraindicated in gaſtric affections, plethora, highly inflammatory ſtate of the body, and determination of the blood to particular viſcera.

In intermittents, it is ſaid to have been uſed with good effect in every ſtage. Given even in the hot ſtage, it has been obſerved to allay the heat, thirſt, headach, and delirium, to induce ſweat and

fleep, to cure the difeafe with lefs bark, and without leaving abdominal obftructions or dropfy.

In fevers of the typhoid type, accompanied with watchfulnefs or diarrhœa, it is extremely ufeful; but when not indicated by particular fymptoms, it does harm, by augmenting thirft, and producing conftipation. Efpecially when combined with calomel, it has lately been much employed in inflammations from local caufes, fuch as wounds, fractures, burns, abforption of morbid poifons, as in fwelled tefticle, &c. and even in active inflammations, accompanied with watchfulnefs, pain, and fpafm, after blood-letting.

In fmall-pox, when the convulfions before eruption are frequent and confiderable, or when the accompanying fever is of the typhoid type, opium is liberally ufed. It is likewife given from the fifth day onwards; and is found to allay the pain of fuppuration, to promote the pytalifm, and to be otherwife ufeful.

In dyfentery, after the ufe of gentle laxatives, or along with them, opium, independently of any effect it may have on the fever, is of confequence in allaying the tormina and tenefmus, and in obviating that laxity of bowels which fo frequently remains after that difeafe.

In diarrhœa, the difeafe itfelf generally carries off any acrimony that may be a caufe, and then opium is ufed with great effect. Even in the worft fymptomatic cafes, it feldom fails to alleviate.

In cholera and pyrofis, it is almoft the only thing trufted to.

In colic, it is employed with laxatives; and often prevents ileus and inflammation, by relieving the fpafm. Even in ileus it is fometimes ufed to allay the vomiting, the fpafms, and the pain.

It is given to allay the pain and favour the defcent of calculi, and to give relief in jaundice and dyfuria proceeding from fpafm.

It is of acknowledged ufe in the different fpecies of tetanus; affords relief to the various fpafmodic fymptoms of dyfpepfia, hyfteria, hypochondriafis, afthma, rabies canina, &c. and has been found ufeful in fome kinds of epilepfy.

In fyphilis it is only ufeful in combating fymptoms, and in counteracting the effects refulting from the improper ufe of mercury, for it poffeffes no power of overcoming the venereal virus.

It is found ufeful in certain cafes of threatened abortion and lingering delivery, in convulfions during parturition, and in the after pains and exceffive flooding.

The adminiftration of opium to the unaccuftomed, is fometimes very difficult. The requifite quantity is wonderfully different in different perfons, and in different ftates of the fame perfon. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dofe

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that might prove fatal in cholera or colic, would not be perceptible in many cafes of tetanus or mania. When given in too fmall a dofe, it is apt to produce difturbed fleep, and other difagreeable confequences; but fometimes a fmall dofe has the defired effect, while a larger one gives rife to vertigo and delirium, and with fome conftitutions it does not agree in any dofe or form. Its ftimulant effects are moft certainly produced by the repetition of fmall dofes, its anodyne by the giving of a full dofe at once. In fome it feems not to have its proper effect till after a confiderable time. The operation of a moderate dofe is fuppofed to laft in general about eight hours from the time of taking it.

Externally, opium is ufed to diminifh pain, and to remove fpafmodic affections. It is found particularly ferviceable in chronic ophthalmia, when accompanied with morbidly increafed fenfibility.

Opium may be exhibited,

1. In fubftance, made up in the form of a pill, troche, or electuary. Its moft efficient form.
2. Diffolved in diluted alcohol, or white wine.
3. Diffolved in water or watery fluids. Very perifhable.
4. Dried and reduced to powder.

It is often given in combination with aromatics, aftringents, emetics, bitters, camphor, foap, diftilled waters, mucilage, fyrups, acids, carbonate of ammonia, ether, acetate of lead, tartrate of antimony and potafs, and unctuous fubftances. Some of thefe are certainly unchemical mixtures, for I find by experiment that the folutions of opium are copioufly precipitated by aftringents, the alkaline carbonates, and all the metallic falts.

Off. prep.—Pil. *Lond. Ed.* Opium purificat. *Lond. Dub.* Extract. opii, *Ed. Lond.* Troch. glycyrr. cum opio, *Ed. Lond.* Elect. five Confect. opiat. *Ed. Lond.* Elect. catechu, *Ed. Dub.* Tinctura opii, *Ed. Lond. Dub.* Tinct. opii camph. *Lond. Dub.* Tinct. op. ammoniat. *Ed.* Syr. opii, *Dub.* Syr. papav. fomniferi, *Ed. Lond.* Pulv. opiat. *Ed.* Pulv. ipecac. et opii, *Ed.*

PARIETARIA OFFICINALIS. *Parietaria. Lond.*
Polygamia Monœcia.—Nat. ord. *Scabridæ.*
Pellitory of the wall.
Off.—Herba. The herb.

This is a fmall plant growing upon old walls; of an herbaceous fub-faline tafte, without any fmell.

PASTINACA OPOPONAX. *Opoponax. Lond.*
Willd. g. 558, *sp.* 3. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Opoponax.

Off.—Gummi-resina. A gum-resin.

This plant is perennial, and grows wild in the south of Europe; but the gum-resin which is said to be obtained by wounding the stalk or root, is brought from the Levant and East Indies, sometimes in round drops or tears, but more commonly in irregular lumps, of a reddish yellow colour on the outside with specks of white, inwardly of a paler colour, and frequently variegated with large white pieces. It has a peculiar strong smell, and a bitter, acrid, somewhat nauseous, taste.

Neumann got from 480 parts, 166 alcoholic, and afterwards 180 watery extract; and inversely 226 watery, and 60 alcoholic. Both the water and alcohol distilled from it were impregnated with its flavour. It forms a milky solution with water, and yields a little essential oil on distillation. It is supposed to be emenagogue, but is rarely used.

Off. prep.—Pil. galb. comp.

PHASIANUS GALLUS. *Lond. Dub.*
Cl. *Aves.* Ord. *Gallinæ.*

The dung-hill fowl.

Off.—Ovum, ejusque putamen. The egg, and egg-shell.

From what country this useful bird originally came, is not ascertained. It is now domesticated almost everywhere, and furnishes one of the most wholesome and delicate articles of food.

The egg only is officinal. The shell consists principally of carbonate of lime, with a small quantity of phosphate of lime and animal matter. When burnt, the animal matter and carbonic acid are destroyed, and we obtain a lime, mixed with a little phosphate of lime.

The contents of the egg consist of two substances, the white, and the yolk, The white is albumen, combined with a little soda and sulphur. The yolk is also albuminous, but contains moreover a bland oil, and some colouring matter. The latter is sometimes used in pharmacy for suspending oily and resinous substances in water. The former is used for clarification.

Off. prep.—Ovorum testæ ppt. *Dub.* Cataplasm alumin. *Lond. Dub.*

PHYSETER MACROCEPHALUS. *Ed. Lond. Dub.*
Cl. *Mammalia.* Ord. *Catacea.*

Spermaceti-whale.

Off.—Materia in cranio reperta, *Spermaceti* dicta. The suet. Spermaceti.

The ſpermaceti whale is characterized by his enormous head, great part of which is occupied by a triangular cavity of bone, covered only by the common integuments. In the living animal this cavity is filled with a white, fluid, oily, ſubſtance, amounting ſometimes to many tons in weight. On the death of the whale, it congeals into a white unctuous maſs, from which a conſiderable quantity of very pure whale oil is obtained by expreſſion. The reſiduum, afterwards freed from impurities, by waſhing with water, melting, ſtraining, expreſſion through linen bags, and, laſtly, waſhing in a weak ley of potaſs, is the peculiar ſubſtance well known by the name of Spermaceti. It is alſo contained in ſolution in the common whale and other fiſh-oils; for it is often found depoſited, by a ſpecies of cryſtallization, in the reſervoirs containing them.

The chemical properties of ſpermaceti have been already noticed. As a medicine, for internal uſe, it agrees with the fixed vegetable oils; and in the compoſition of ointments, &c. its place may be very well ſupplied by a mixture of oil and wax.

Off. prep.—Ungt. ſperm. ceti, *Lond. Dub.* Ungt. ceræ, *Lond. Dub.* Cerat. ſimp. *Ed. Lond. Dub.*

PIMPINELLA ANISUM. *Ed.* *Aniſum. Lond. Dub.*

Willd. g. 562, *ſp.* 8. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Aniſe.

Off.—Semen. The ſeed.

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the eaſt. It is cultivated in ſome parts of France, Germany, and Spain, and may be raiſed alſo in England: the ſeeds brought from Spain, which are ſmaller than the others, are preferred.

Aniſeeds have an aromatic ſmell, and a pleaſant warm taſte, accompanied with a degree of ſweetneſs. Water extracts very little of their flavour; rectified ſpirit the whole.

Off. prep.—Ol. volat. *Ed. Lond. Dub.* Spirit. *Lond.*

PINUS.

Monœcia Adelphia.—Nat. ord. *Coniferæ.*

Sp. Pinus Abies.

a. Reſina ſponte concreta, vulgo *Pix Burgundica, Ed. Dub.*

b. Reſina alba, Dub. Thus, Lond.

Common ſpruce-fir. Burgundy-pitch. Common frankincenſe.

Sp. Pinus Balsamea. *Reſina liquida, vulgo Balſamum Canadenſe. Ed. Lond. Dub.*

Hemlock-fir. Balſam of Canada.

Sp. Pinus Larix.

a. Resina liquida, vulgo Terebinthina Veneta. Ed. Dub.
b. Oleum volatile, vulgo Oleum terebinthinæ. Ed.

The larch. Venice turpentine. Oil of turpentine.

Sp. Pinus Sylvestris.

a. Resina empyreumatica Pix liquida dicta. Ed. Dub.
b. Terebinthina vulgaris. Dub.
c. Resina alba. Dub.

Scotch fir. Tar. Common turpentine. Common frankincense.

These different species of fir are all natives of sandy situations. The last only grows wild in this country. They all abound in every part with a resinous juice, which possesses the same general qualities, but presents some varieties, according to the nature of the species and mode of preparation.

We may arrange the products,

1. Into those which exude spontaneously.
2. Into those procured by wounding the tree.
3. Into those procured by decoction. And,
4. Into those which are procured by the action of fire.

The pinus larix exudes a species of manna, called Briançon Manna, but which is not used; as, besides the saccharine matter, it evidently contains turpentine.

Resina Pini Sponte Concreta.

Concrete resin of pine.

From the pinus abies, and perhaps from the pinus sylvestris, in warm seasons and climates, a resinous juice exudes spontaneously, which hardens into tears by exposure to the air. It is the *Thus* of the London Pharmacopœia, the *Resina alba* of the Dublin, or common frankincense. It is a solid brittle resin, brought to us in little globes, or masses, of a brownish or yellowish colour on the outside; internally whitish, or variegated with whitish specks, of a bitterish, acrid, not agreeable taste, without any considerable smell.

Off. prep.—Emplast. lad. comp. *Lond.* Empl. thuris comp. *Lond.* Empl. lith. comp. *Lond.*

Resina Pini Abietis. *Ed.* *Pix Burgundica. Dub.*

Burgundy pitch.

Real Burgundy pitch is collected, according to Tingry, from the pinus picea, or spruce fir tree. The resinous juice which exudes from this species is less fluid, and less transparent, than the proper turpentines. It is collected by the peasants, strained

through cloths, and put into barrels. If its confiftence be too thick, it is mixed over the fire with a little turpentine, and oil of turpentine. A fimple mixture of gallipot and barras, made without heat, is often fold under the name of Burgundy pitch, but the mafs refulting from this combination foon becomes friable. It has neither the unctuofity, vifcidity, tenacity, nor fmell, which diftinguifh the real kind.

Although gallipot contains effential oil, the quantity is fo fmall that it is never diftilled from it. It is purified by melting it with a very gentle fire, and filtrating it. By this procefs it ftill contains effential oil, and is often fold by the name of Burgundy pitch. If boiling water be added to it after it is ftrained, but while it is ftill fluid, and they be agitated together till the mafs cools, we have a yellow refin, which, from ftill containing fome effential oil, is preferred to that prepared by a fimilar procefs from the refiduum of the diftillation of turpentine.

Off. prep.—Emplaft. picis Burgund. *Ed. Lond. Dub.* Emplaft mel. vefic. comp. *Ed.*

RESINÆ LIQUIDÆ PINI, vulgo *Terebinthinæ.*

Liquid refin of pine, commonly called Turpentine.

To obtain the products of the fecond kind, a feries of wounds are made through the bark into the wood, beginning at the bottom, and rifing gradually upwards, until a ftripe of the bark, about nine feet high, be removed, which is commonly effected in about four years. The fame operation is then repeated on the oppofite fide. The operation is then recommenced clofe to the edge of the former wound, which by this time is nearly clofed. A tree worked in this manner will furvive and furnifh turpentine for near a century. The juice which flows from thefe wounds during fummer, is collected in a fmall cavity, formed in the earth at the bottom of the incifions, from which it is occafionally removed into proper refervoirs previous to its purification. As the trees exude very little juice during cold weather, no new incifions are made in winter; but the old ones get covered with a foft refinous cruft, called *barras*, when it is impure, and mixed with bits of bark, duft and fand; *gallipot*, when collected with more care; or white incenfe, when it is allowed to remain fo long expofed that it becomes refinified, which is fcraped off, and alfo collected for fubfequent purification.

All thefe products are purified by liquefaction and filtration. They confift almoft entirely of an effential oil and a refin, and differ only in the proportions, the turpentine containing moft oil, and the gallipot moft refin.

Turpentines have different appellations, chiefly according to the country from which they are procured.

Balſam of Canada, from the *Pinus balſamea, et Pinus Canadenſis.*
Reſina liquida. Ed. *Balſamum Canadenſe.* Lond. Dub.
Cyprian turpentine, from the *Piſtacia terebinthus.*
Terebinthina Chia. Lond.
Straſburgh turpentine, from the *Pinus picea.*
Venice turpentine, from the *Pinus larix.*
Reſina liquida. Ed. *Terebinthina Veneta.* Lond.
Common turpentine, from the *Pinus ſylveſtris.*
Terebinthina vulgaris. Lond. Dub.
Hungarian balſam, from the *Pinus ſylveſtris var. Mughos.*
Carpatian balſam, from the *Pinus cembra.*

None of theſe are properly balſams; which term is now uſed to expreſs thoſe oily reſinous ſubſtances only which contain benzoic acid. The Edinburgh college have denominated them liquid reſins, the moſt correct appellation they have yet received.

All theſe ſpecies of turpentine poſſeſs the ſame general properties. They are more or leſs fluid, with different degrees of tranſparency; of a whitiſh or yellowiſh colour; a penetrating ſmell, and a warm, pungent, bitteriſh taſte. They are entirely ſoluble in alcohol, combine with fixed oil, and impart their flavour to water, but are not ſoluble in it. They are decompoſed by a moderate heat, being ſeparated into an eſſential oil and a reſin, and are exceedingly inflammable, burning with a large white flame, and much ſmoke.

Each ſpecies has ſome peculiarities. The Canadian is reckoned the beſt, and next to it the Chian. They are more tranſparent, and have a more agreeable flavour than the other ſorts. The common turpentine, as being the moſt offenſive, is rarely given internally; its principal uſe is in plaſters and ointments among farriers, and for the diſtillation of the eſſential oil.

Medical uſe.—Taken internally, they are active ſtimulants, increaſe the ſecretion of urine, to which they give the ſmell of violets, even though applied only externally, and open the bowels. In all caſes accompanied with inflammation, they ought to be abſtained from, as this ſymptom is increaſed, and not unfrequently occaſioned, by them. They are principally recommended in gleets, the fluor albus, and the like. Their doſe is from a ſcruple to a drachm and a half. They are moſt commodiouſly taken in the form of a bolus, or blended with watery liquors, by the mediation of the yolk of an egg or mucilage. They may alſo be given in the form of electuary, mixed with twice their weight of honey, and in the doſe of a drachm of the compound twice or thrice a-day, or of clyſter, half an ounce being well triturated with the yolk of an egg, and mixed with half a pound of gruel or decoction of chamomile.

Off. prep.—Ol. volat. *Lond. Dub.* Ungt. infuf. mel vefic. *Ed.* Emplaft. mel vefic. comp. *Ed.* Empl. litharg. comp. *Lond.* Ungt. elemi, *Lond. Dub.*

OLEUM PINI VOLATILE. *Ed.* *Oleum Terebinthinæ. Lond. Dub.*
Oil of turpentine.

IN the Edinburgh Pharmacopœia this effential oil is officinal: by the other colleges directions are given for their preparation.

It is lighter than water, tranfparent, limpid, and volatile. It has a hot pungent tafte, and a penetrating fmell; is highly inflammable, and poffeffes all the other properties of effential oils.

It is remarkably difficult of folution in alcohol, although turpentine itfelf diffolves eafily. One part of the volatile oil is indeed apparently taken up by feven of alcohol, but on ftanding, the greateft part of the oil falls to the bottom, a much larger quantity being neceffary to retain it in folution.

Med. ufe.—As a medicine, it is highly ftimulating and penetrating. Internally it acts as a diuretic or fudorific in very fmall dofes. It has, however, been given in much larger dofes, efpecially when mixed with honey. Recourfe has principally been had to fuch dofes in cafes of chronic rheumatifm, particularly in thofe modifications of it which are ftyled *fciatica* and *lumbago.* But it has not been often fuccefsful, and fometimes has had the effect of inducing bloody urine.

Externally, it often produces excellent effects as a difcutient in indolent tumours; as a ftimulus in paralyfis of the extremities, and in bruifes; as an antifpafmodic, and as a ftyptic, when applied as hot as the patient can bear it, on compreffes directly to the bleeding mouths of the veffels.

Off. prep.—Ol. tereb. puriff. *Ed. Lond. Dub.*

EXTRACTUM PINI.
Extract of pine.

A fluid extract, prepared by decoction from the twigs of the pinus fylveftris, is the well-known effence of fpruce, which, fermented with molaffes, forms the fafhionable beverage of Spruce beer.

RESINA EMPYREUMATICA PINI *Pix liquida dicta. Ed. Lond. Dub.*
Tar. Empyreumatic refin of pine.

THE laft kind of products from the different fpecies of fir are obtained by the action of fire. With this view, a conical cavity is dug out in the earth, communicating at the bottom with a refervoir. Billets or thin laths of wood are then placed, fo as not only to fill the cavity, but to form a conical pile over it, which is

covered with turf, and kindled at the top. The admiſſion of air is ſo regulated, that it burns from above downwards, with a ſlow and ſmothered combuſtion. The ſmoke and vapours formed are obliged to deſcend into the excavation in the ground, where they are condenſed, and paſs along with the matters liquefied into the receiver. This mixture is denominated Tar; and the wood itſelf is reduced to charcoal. By long boiling, tar is deprived of its volatile parts, and converted into pitch.

Tar is a mixture of reſin, empyreumatic oil, charcoal, and acetous acid. Its colour is derived from the charcoal; and the other properties in which it differs from a common reſin, depend on the preſence of acetous acid and empyreumatic oil. The acid itſelf is not only ſoluble in water, but it alſo renders the empyreumatic oil ſoluble in larger quantities than it otherwiſe would be.

Medical uſe.—Tar-water is a heating diuretic and ſudorific remedy; but by no means ſo powerful, or ſo generally admiſſible, as it was repreſented by Biſhop Berkley. Tar is applied externally in tinea capitis, and ſome other cutaneous diſeaſes.

Off. prep.—Ungt. picis, *Ed. Lond. Dub.*

But the moſt remarkable production of the pine tribe is that of a real gum, entirely ſoluble in water, from a tree ſo reſinous as the Pinus larix. It is prepared in the Ural larch foreſts; and exudes, according to Profeſſor Pallas, from the interior parts of the wood when it is burning.

PIPER.

Willd. g. 74. *Diandria Trigynia.*—Nat. ord. *Piperitæ.*

Sp. 1. PIPER NIGRUM. *Bacca. Lond. Fructus. Ed. Semina. Dub.*

Black pepper.

Off.—Bacca. The berry.

THE black pepper is the fruit of a ſhrubby creeping plant, which grows wild in the Eaſt Indies, and is cultivated in Java and Malabar, by which means the fruit is much improved. The berries are gathered before they are ripe, and are dried in the ſun. They become black and corrugated on the ſurface; their taſte is hot and fiery, and their ſmell ſlightly aromatic.

Neumann got from 7680 parts 4800 watery, and afterwards 180 alcoholic extract; and inverſely, 1080 alcoholic, and 3640 watery. The principle on which its pungency depends, was ſoluble both in water and in alcohol, and was not volatile, for 7680 grains furniſhed about 150 of a very bland volatile oil. From this analyſis Dr. Thomſon differs conſiderably. By macerating it in alcohol, and diſtilling the tincture, he got a green volatile oil, having the whole flavour and pungency of the pepper. Be-

ſides this eſſential principle, he found it to contain an extractive and ſtarch.

White pepper is the fruit of the ſame plant, gathered after it is fully ripe, and freed of its external coat by maceration in water. It is ſmooth on the ſurface, and leſs pungent than the black pepper.

Off. prep.—Emplaſt. mel veſic. comp. *Ed.*

Sp. 3. PIPER CUBEBA. *Cubeba. Lond.*
Cubeba.

CUBEBS are a fruit brought from Java. This fruit has a great reſemblance to pepper. The principal difference diſtinguiſhable by the eye is, that each cubeb is furniſhed with a long ſlender ſtalk, whence they are called by ſome *piper caudatum.* In aromatic warmth and pungency, cubebs are far inferior to pepper.

Neumann got from 960 grains, 310 alcoholic, and 272 watery extract; and inverſely, 380 watery, and 61 alcoholic. It alſo furniſhes ſome volatile oil.

Sp. 12. PIPER LONGUM. *Lond. Ed. Dub.*
Long pepper.
Off.—Fructus, ſemina. The fruit and ſeeds.

THE plant which bears the long pepper is alſo a ſarmentaceous climber. The berries are ſmall round grains, diſpoſed ſpirally in a long cylindrical head. They are gathered before they are ripe, and dried, and are the hotteſt of all the peppers.

The warmth and pungency of theſe ſpices reſide entirely in a reſin; their aromatic odour is an eſſential oil. In medicine, they are ſometimes employed as acrid ſtimulants; but their chief uſe is in cookery, as condiments.

Off. prep.—Tinct. cin. comp. *Ed. Lond. Dub.* Confect. opiat. *Lond.* Pulv. aromat. *Lond. Dub.* Pulv. cret. comp. *Lond.*

PISTACIA.
Dioecia Pentandria.—Nat. ord. *Amentaceæ.*

Sp. PISTACIA TEREBINTHUS. *Terebinthina Chia. Lond.*
Chian turpentine.

THE tree which yields this turpentine grows in India, the north of Africa, and ſouth of Europe; but the turpentine is principally collected in the iſlands of Chios and Cyprus, by wounding the tree. It does not differ in any thing material, except its price, from the other turpentines.—See PINUS.

Sp. PISTACIA LENTISCUS. *Ed.* *Maſtiche. Lond.*
Maſtich.

Off.—Refina. The refin.

THIS fpecies is a native of the fame countries with the former. It is obtained principally in the ifland of Chios, by making tranfverfe incifions into the tree, and allowing the juice to harden. It is brought in fmall, yellowifh, femi-tranfparent, brittle grains; of a fmooth and fhining fracture, foftening when chewed, fufible, burning with a pleafant fmell, infoluble in water, and partially foluble in alcohol and fixed oils. Neumann found that, during digeftion with alcohol, a portion feparates, infoluble in alcohol, though in appearance refinous, amounting to about one tenth of the maftich. This is probably the fame with the fubftance found in Sandarach by Mr. Giefe, and called Sandaracha by Dr. Thomfon.

Its flavour is communicated to water. It is therefore a refin, combined with a little effential oil. It is principally ufed by the Turkifh women as a mafticatory, to preferve the teeth, and to give a pleafant fmell to the breath.

PLUMBUM. *Ed. Lond.*
Lead.

THE general properties of lead have been already enumerated. Lead is found,

I. Oxidized:
1. Lead ochre of different colours.

II. Oxidized, and combined with acids.
2. Carbonated lead. White lead fpar
3. Murio-carbonated.
4. Phofphated lead. Green lead ore.
5. Arfeniated lead.
6. Arfenio-phofphated lead.
7. Molybdated lead.
8. Sulphated lead.

III. Sulphuretted:
9. Sulphuretted lead. Galena.
10. Sulphuretted oxide of lead.

Lead is obtained by various proceffes from thefe ores. In its metallic form it is fcarcely an officinal article, as its different oxides are purchafed from the manufacturers, and never prepared by the apothecary.

Lead admits of three ftates of oxidization, according to Dr. Thomfon.

			LEAD.	OXYGEN.
Protoxide.	Yellow.	- -	90.5	9.5
Deutoxide.	Red.	- -	88.	12.
Peroxide.	Brown.	- -	80.	20.

Med. uſe.—Its effects on the body are emaciation, violent colics, paralyſis, tremors, and contractions of the limbs; and as they generally come on gradually, the cauſe is ſometimes overlooked till it be too late. Poiſoning from lead is never intentional, but only accidental, either from liquors becoming impregnated with lead, by being improperly kept in veſſels lined or glazed with lead, or to which lead has been criminally added, to correct its acidity; or among manufacturers who work much with lead, as painters and plumbers, and who are not ſufficiently attentive to avoid ſwallowing any of it.

The preſence of lead in any ſuſpected liquor is detected by the hydro-ſulphuret of potaſs, which forms with it a brown precipitate, not ſoluble in diluted muriatic acid; and ſtill more certainly, by evaporating a portion of it to dryneſs, and expoſing the extract to a heat ſufficient to reduce the lead.

Oxidum Plumbi Album. *Ed.* *Ceruſſa. Lond. Dub.* *Carbonas Plumbi.*

White oxide of lead. Ceruſe. White lead.

This ſubſtance is prepared by expoſing lead to the vapour of vinegar. To accelerate the oxidizment, the lead is caſt in thin plates, which are rolled up ſpirally. A number of theſe are placed perpendicularly on a ſupport, over a flat veſſel containing vinegar, which is converted into vapour by a gentle heat, ſuch as that of dung. The plates become ſlowly covered with a white cruſt, which is in due time removed; and the remains of the plates are again expoſed to the vapour of vinegar, until they be entirely corroded. Van Mons ſays, that if lead aſhes be diſſolved in diluted nitric acid, and precipitated by chalk in impalpable powder, the precipitate, when waſhed and dried, will be ceruſe in its pureſt ſtate.

White oxide of lead has a ſcaly or foliated texture, is brittle, friable, heavy, of a ſnowy whiteneſs, and a ſweet taſte. It is often adulterated with earthy ſubſtances, which may be diſcovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarſer particles cannot be ſeparated by means of a ſieve, becauſe its interſtices ſoon get filled up. It can only be obtained in the ſtate of a fine powder, by rubbing a loaf of ceruſe on a ſieve placed over a ſheet of paper. It conſiſts of 86 yellow oxide of lead, and 14 water; or if native, 84 and 16.

In pharmacy the white oxide of lead is uſed in the compoſition of ointments and plaſters.

Off. prep.—Acetis plumbi, *Ed. Lond. Dub.* Ungt. oxidi plumbi albi, *Ed.* Pulv. ceruſſæ comp. *Lond.*

OXIDUM PLUMBI RUBRUM. *Ed.* *Minium. Lond.*

Red oxide of lead. Red lead.

THE preparation of red lead is ſo troubleſome and tedious, that the preparation of it forms a diſtinct branch of buſineſs. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpoſe, and ſo contrived, that the flame acts upon a large ſurface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead is deſtroyed; after which, the oxide is only now and then turned.

The red oxide of lead is obtained in the form of a very heavy powder, conſiſting of minute ſhining ſcales, of a bright ſcarlet, verging towards yellow, eſpecially if triturated. It is ſometimes adulterated with red oxide of iron, red bole, or powdered brick. Theſe frauds are detected by the inferiority of colour, by mixing it with oil, and ſubjecting it to the teſt of reduction; and by its forming a black precipitate with tincture of galls, when diſſolved in nitrous acid.

The red oxide of lead contains 88 lead and 12 oxygen. When red lead is treated with diluted nitrous acid, 76 parts are diſſolved, and 24 of a flea-brown powder remain behind. This powder is the peroxide of lead, and contains 20 per cent. oxygen. It is only ſoluble in the hyper-oxymuriatic acid. The 76 parts diſſolved are yellow oxide.

OXIDUM PLUMBI SEMIVITREUM *Ed. Lithargyrus. Lond. Dub.*

Semi-vitrified oxide of lead. Litharge.

IF oxidized lead be urged with a haſty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greateſt part of the litharge met with in the ſhops is produced in the purification of ſilver from lead, and the refining of gold and ſilver by means of this metal. According to the degree of fire and other circumſtances, it proves of a pale or deep colour; the firſt has been commonly called Litharge of ſilver, the other, Litharge of gold. Litharge is a ſub-carbonate of lead. It contains 96 yellow oxide, and 4 carbonic acid. It alſo frequently contains a little oxide of antimony

The oxides of lead diſſolve by heat in expreſſed oils; theſe mixtures are the baſis of ſeveral officinal plaſters and ointments.

Lead and its oxides, when undiſſolved, have no conſiderable effects as medicines. Diſſolved in oils, they are ſuppoſed to be (when externally applied) anti-inflammatory and deſiccative. Combined with vegetable acids, they are remarkably ſo; and taken internally, prove powerful, though dangerous ſtyptics.

Off. prep.—Litharg. ppt. *Ed. Dub.* Aqua lith. acet. *Lond. Dub.* Emplaſt. *Ed. Lond. Dub.* Cerat. ſaponis, *Lond. Dub.*

POLYGALA SENEGA. *Ed.* *Seneka. Lond. Dub.*

Diadephia Octandria.—Nat. ord. *Lomentaceæ.*

Seneka, or Rattleſnake Root.

Off.—Radix. The root.

SENEKA is a perennial plant, which grows wild in North America, particularly Virginia and Pennſylvania. This root is uſually about the thickneſs of the little finger, variouſly bent and contorted, and appears as if compoſed of joints, whence it is ſuppoſed to reſemble the tail of the animal whoſe name it bears; a kind of membranous margin runs on each ſide the whole length of the root.

The bark is the active part of the root. Its taſte is at firſt acrid, afterwards very hot and pungent. It has no ſmell.

Its acrimony reſides in a reſin; for it is entirely extracted by alcohol; is precipitated by water; does not riſe in diſtillation; and is not deſtroyed by keeping.

Medical uſe.—It is an active ſtimulus, and increaſes the force of the circulation, eſpecially of the pulmonary veſſels. It has therefore been found uſeful in typhoid inflammations of the lungs; but it is apt to diſorder the ſtomach, and to induce diarrhœa. Dr. Brandreth of Liverpool has derived great benefit in ſome caſes of lethargy from an extract of ſeneka combined with carbonate of ammonia.

Some have likewiſe employed this root in hydropic caſes, and not without ſucceſs. There are examples of its occaſioning a plentiful evacution by ſtool, urine, and perſpiration; and by this means removing the diſeaſe, after the common diuretics and hydragogues had failed.

The Senegaro Indians are ſaid to prevent the fatal effects of the bite of the rattleſnake, by giving it internally, and by applying it externally to the wound.

The uſual doſe of the powder is 30 grains or more.

Externally, it has been advantageouſly uſed as a ſtimulating gargle in croup.

Off. prep.—Decoct. *Ed.*

POLYGONUM BISTORTA. *Ed.* *Biſtorta. Dub. Lond.*
Willd. g. 785, *ſp.* 3. *Octandria Trigynia.*—Nat. ord. *Oleraceæ.*
Great biſtort, or ſnakeweed.
Off.—Radix. The root.

THIS plant is perennial, and grows wild in moiſt meadows in ſeveral parts of Britain. The root is about the thickneſs of the little finger, of a blackiſh brown colour on the outſide, and reddiſh within: it is writhed or bent vermicularly, whence the name of the plant, with a joint at each bending, and full of buſhy fibres; the root of the ſpecies here mentioned has, for the moſt part, only one or two bendings, others have three or more. All the parts of biſtort have a rough auſtere taſte, particularly the root, which is one of the ſtrongeſt of the vegetable aſtringents.

Medical uſe.—It is employed in hæmorrhagies and other fluxes, both internally and externally, where aſtringency is the only indication. To the ſudorific, antipeſtilential, and antiſeptic virtues attributed to it, it has no other claim than what it derives from its aſtringency.

POLYPODIUM FILIX MAS. *Ed.* *Filix. Lond. Filix Mas. Dub.*
Cryptogamia. Filices.—Nat. ord. *Filices.*
Male fern. Male polypody.
Off.—Radix. The root.

THIS fern is perennial, and is found in great abundance in our woods. The root conſiſts of many egg-ſhaped knots, cloſely compreſſed together, forming a crooked maſs, of a blackiſh colour, and covered with brown ſcales.

When chewed, its taſte is ſomewhat mucilaginous and ſweet, and afterwards ſlightly aſtringent and bitter. Its ſmell is alſo weak.

Med. uſe—This root was uſed as an anthelmintic in the days of Dioſcorides. It gradually became neglected; but its uſe was again revived at different times by Madame Nuffer, Herrenſchwand, and others, who frequently ſucceeded in killing and expelling the tænia, both lata and cucurbitina, by the exhibition of ſecret remedies, of which the fern-powder was, or rather was ſuppoſed to be, the principal ingredient; for there is much reaſon to believe, that the active purgatives with which it was always combined, were really the remedies which effected the cure.

The ſame, or nearly a ſimilar ſecret, has been bought by different potentates, and publiſhed for the benefit of thoſe ſuffering under this obſtinate diſeaſe.

The internal ſolid part of the root only is to be powdered, and the powder ſhould have a reddiſh colour; and as the doſe and exhibition of the remedy muſt be regulated according to the age, ſex, and conſtitution of the patient, it muſt be given always under the direction of an experienced practitioner.

POTENTILLA REPTANS. *Pentaphyllum. Lond*

Willd. g. 1000, *ſp.* 34. *Icoſandria Polygamia.*—Nat. ord. *Senticoſæ.*

Common cinquefoil

Off.—Radix. The root.

THIS plant is perennial, and grows plentiful in hedges, and by road ſides. The root is moderately aſtringent, and as ſuch, is ſometimes given internally in diarrhœas and other fluxes, and employed in gargariſms for ſtrengthening the gums, &c. The cortical part of the root may be taken in ſubſtance, to the quantity of a drachm: the internal part is conſiderably weaker, and requires to be given in double the doſe to produce the ſame effect.

PRUNUS.

Willd. g. 982. *Icoſandria Monogynia.*—Nat. ord. *Pomaceæ.*

Sp. 29. PRUNUS DOMESTICA. *Ed. Lond. Dub.*

Plumb tree.

Off.—Fructus, *Prunum Gallicum* dictus. The dried fruit, called French prunes.

THIS tree is found wild in hedges in England, but has probably originated from the ſtones of the cultivated kinds being dropt there by accident. Great quantities of the dried fruit are imported from the continent, of which the French are reckoned the beſt.

Medical uſe.—They contain much mucilaginous and ſaccharine matter, and their medical effects are, to abate heat, and gently looſen the belly, which they perform by lubricating the paſſages, and ſoftening the excrement. They are of conſiderable ſervice in coſtiveneſs, accompanied with heat or irritation, which the more ſtimulating cathartics would tend to aggravate: where prunes are not of themſelves ſufficient, their action may be promoted by joining with them a little rhubarb or the like; to which may be added ſome carminative ingredient, to prevent their occaſioning flatulency.

Off. prep.—Elect. ſennæ, *Ed. Lond. Dub.*

Sp. 32. Prunus Spinosa. *Prunus sylvestris. Lond.*
The sloe.

Off.—Fructus. The fruit.

The sloe also grows wild in Britain. The fruit has a very astringent sourish taste. It contains malic acid. The inspissated juice of the unripe fruit is very astringent, and is called *Acacia Germanica.* An infusion of a handful of the flowers is a safe and easy purge. The powdered bark will sometimes cure agues.

Off. prep.—Conserva, *Lond.*

PTEROCARPUS.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Sp. Pterocarpus Santalinus. *Ed. Santalum rubrum. Lond. Dub.*

Red saunders.

Off.—Lignum. The wood.

This tree grows in the East Indies, and acquires a very large size. The wood is brought in large billets, of a compact texture, a dull red, almost blackish colour on the outside, and a deep brighter red within. It has no manifest smell, and little or no taste. It communicates a deep red to alcohol, but gives no tinge to aqueous liquors: a small quantity of the resin, extracted by means of spirit, tinges a large one of fresh spirit, of an elegant blood red. Neumann got from 960 grains 210 alcoholic, and afterwards 20 of watery extract; and inversely, 126 tough watery extract, and 120 alcoholic. According to the same chemist, it gives out its colouring matter to volatile oil of lavender, but not to volatile oil of turpentine. Is this difference to be ascribed to the camphor contained in the former?

Off. prep.—Tinct. lav. comp. *Ed. Lond. Dub.*

Sp. Pterocarpus Draco. *Ed. Sanguis draconis. Lond.*
Dragons blood.

Off—Resina. The resin.

This is also a very large tree. It is a native of South America, and the resin which exudes from incisions made in its bark used to be frequently sent from Carthagena to Spain. It is however doubtful if the dragons blood of the shops be produced from this tree, as many others furnish a similar resin, as the dracæna draco, dalbergia monetaria, and especially the calamus draco, which probably furnishes all that is brought from the East Indies.

The best dragons blood is not in cakes, but is brought in small masses, of the size of a nutmeg, wrapt up in the dried leaves of

ſome kind of reed, breaks ſmooth, free from any viſible impurities, of a dark-red colour, which changes, upon being powdered, into an elegant bright crimſon. This drug, in ſubſtance, has no ſenſible ſmell or taſte; when diſſolved, it diſcovers ſome degree of warmth and pungency. It is fuſible and inflammable, and totally ſoluble in alcohol, tinging a large quantity of the ménſtruum of a deep-red colour. It is likewiſe ſoluble in expreſſed oils, and gives them a red hue, leſs beautiful than that communicated by anchuſa. It is not acted upon by water, but precipitated by it from its alcoholic ſolution. I find that it is ſoluble in nitrous acid and alkalies, and that it neither precipitates gelatin, nor affects the colour of the ſalts of iron. It therefore appears to be a pure reſin without any aſtringency. I have been more particular in proving that this reſin is not aſtringent, becauſe both Mr. Murray and Dr. Thomſon have adopted Mr. Prouſt's account of it. But the ſubſtance examined by Mr. Prouſt could not be the reſin known in this country by the name of Dragons blood, as it was as ſoluble in water as in alcohol. Dr. Fothergill, who firſt deſcribed kino, received it as the fineſt dragons blood. Mr. Prouſt muſt have been miſled by ſome ſimilar miſinformation, as the characters of his *ſang dracon* correſpond with thoſe of kino.

Off. prep.—Emp. thuris comp.

PUNICA GRANATUM. *Ed.* *Granatum. Lond. Dub.*

Willd. g. 980, *ſp.* 1. *Icoſandria Monogynia.*—Nat. ord. *Pomaceæ.*

Pomegranate.

Off.—Fructus cortex, flos plenum, vulgo Balauſtium. The outer rind of the fruit. The double flowers, called Balauſtine.

The pomegranate is a low tree, or rather ſhrub, growing wild in Italy and other countries in the ſouth of Europe. It is ſometimes met with in our gardens; but the fruit, for which it is chiefly valued, rarely comes to perfection. This fruit has the general qualities of the other ſweet ſummer fruits, allaying heat, quenching thirſt, and gently looſening the belly. The rind is a ſtrong aſtringent, ſtriking a permanent blue with ſulphate of iron, and as ſuch is occaſionally made uſe of. The flowers are of an elegant red colour, in appearance reſembling a dried red roſe. Their taſte is bitteriſh and aſtringent. They are recommended in diarrhœas, dyſenteries, and other caſes where aſtringent medicines are proper.

PYRUS CYDONIA. *Cydonia Malus. Lond.*

Willd. g. 992, *ſp.* 17. *Icoſandria Pentagynia.*—Nat. ord. *Pomaceæ.*

The quince.

Off.—Fructus, ejusque semen. The fruit and seeds.

THE quince is originally a native of Crete, but ripens its fruit perfectly in England.

Quinces have a very austere acid taste: taken in small quantity, they are supposed to restrain vomiting and alvine fluxes; and more liberally, to loosen the belly. The seeds abound with a mucilaginous substance, of no particular taste, which they readily impart to watery liquors; an ounce will render three pints of water thick and ropy like the white of an egg. They will not, however, supply the place of gum-arabic, because their mucilage spoils very quickly, and is precipitated by acids.

Off. prep.—Mucilago, *Lond.*

QUASSIA.

Willd. g. 849. *Decandria Monogynia.*—Nat. ord. *Gruinales.*

Sp. 2. QUASSIA SIMARUBA. *Ed.* *Simarouba. Lond. Dub.*

Mountain or bitter damson.

Off.—Cortex. The bark.

THIS tree grows in Guiana and in Jamaica. The simarouba of the shops is the bark of the root of this tree, and not of the quassia amara, as stated by the Dublin college. It is brought to us in pieces some feet long, and some inches broad, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable, taste. It gives out its bitterness both to alcohol and water.

Med. use.—It has been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers.

It is given in powder, in doses of half a drachm, or a whole drachm; but it is too bulky, and very difficultly pulverizable. It is best exhibited in decoction. Two drachms of the bark may be boiled in two pounds of water to one, and the decoction drunk in cupfuls in the course of the day.

Sp. 3. QUASSIA EXCELSA. *Ed.* *Quassia. Lond.*

Quassia.

Off.—Lignum, cortex, radix. The wood, bark, and root.

THIS tree grows in Jamaica, and in the Caribæan islands. The quassia of the shops is the wood of its root, and not of the quassia amara, which is a very rare tree, but surpasses all others in bitterness.

This root is about the thickness of a man's arm: its wood is

whitiſh, becoming yellowiſh by expoſure to the air. It has a thin, grey, fiſſured, brittle bark, which is deemed, in Surinam, more powerful than the wood. Quaſſia has no ſenſible odour, but is one of the moſt intenſe, durable, pure bitters known. Its infuſion, decoction, and tincture are almoſt equally bitter and yellowiſh, and are not blackened by chalybeates. The properties of the extract of quaſſia have been detailed by Dr. Thomſon, under the title of the bitter principle.

Medical uſe.—It is a very pure and ſimple bitter, and may be given in all caſes where bitters are proper. It has been exhibited in intermittent and bilious fevers, in ſtomachic complaints, in lienteria, in cachexy, dropſies, leucorrhœa, and gout. It is much uſed in this country to give the bitterneſs to malt liquors, though it ſubjects thoſe brewers who employ it to a very heavy penalty.

It can ſcarcely be reduced to a ſufficiently fine powder to be given in ſubſtance, and is therefore generally given in the form of infuſion, decoction, or extract.

QUERCUS.

Monoecia Polyandria.—Nat. ord. *Amentaceæ.*

Sp. Quercus Robur. *Ed.* *Quercus. Lond. Dub.*
Oak.
Off.—Cortex. The bark.

The oak grows wild in Britain. The ſuperior excellence of its wood for ſhip-building has rendered its cultivation an object of national concern. Its ſaw-duſt is an uſeful dye-ſtuff, and its bark is the principle article uſed in tanning.

Med. uſe.—The bark is a ſtrong aſtringent, and is recommended in hæmorrhagies, alvine fluxes, and other preternatural or immoderate ſecretions. In theſe it is ſometimes attended with good effects. But it is by no means capable of being employed as a ſubſtitute, in every inſtance, for Peruvian bark, as ſome have aſſerted; and indeed it is ſo difficultly reduced to a ſufficiently fine powder, that it can ſcarcely be given internally in ſubſtance.

Off. prep.—Extract. *Dub.*

Sp. Quercus Cerris. *Ed. Lond. Dub.*
Oriental oak.
Off.—Cyniphis nidus, *Galla* dictus. The neſt of the cynips quercifolii, called Gall nuts.

This ſpecies of oak is a native of the Levant, and of the warmer countries of Europe.

The cynips quercifolii, a hymenopterous inſect, depoſits its

eggs in the leaves and other tender parts of the tree. Around each puncture an excrefcence is prefently formed, within which the egg is hatched, and the infect paffes through all the ftages of its metamorphofis, until it becomes a perfect infect; when it eats its way out of its prifon. Thefe excrefcences are called galls, or gall nuts. They are of different fizes, fmooth or knotty on the furface, of a whitifh, reddifh, or blackifh colour, and generally penetrated with a fmall hole. Internally they confift of a fpongy, but hard, more or lefs brown fubftance, and they have a very rough aftringent tafte. Good galls are of a blackifh-grey, or yellow colour, heavy, and tuberculated on the furface. They are the moft powerful aftringents we poffefs; and, fince the difcovery of the tanning principle by Mr. Seguin, have very much engaged the attention of chemifts. Neumann got from 960 grains of coarfely powdered galls 840 watery extract, and afterwards only 4 alcoholic; and inverfely, 760 alcoholic, and 80 watery. But the moft accurate analyfis is that of Mr. Davy, who found that 500 grains of good Aleppo galls gave, by lixiviating them until their foluble matters were taken up, and evaporating the folution flowly, 185 grains of folid matter, which, when examined by analyfis, appeared to confift of,

Tannin, - - -	130
Mucilage, and matter rendered infoluble by evaporation, - - -	12
Gallic acid, and a little extractive matter,	31
Remainder calcareous earth and faline matter,	12

From my experiments, I am difpofed to think that Mr. Davy has under-rated the tannin of nut-galls; for by fimple repeated infufions in hot water, the refiduum of 500 grains in one experiment amounted only to 158, and in another only to 136. The quantity of tannin eftimated in Mr. Davy's way amounted, in the firft to 221 grains, and in the fecond to 256. The great difference in thefe refults from Mr. Davy's muft be entirely afcribed to fome differences in the galls themfelves, or in the mode of operation. A faturated decoction of galls, in cooling, depofits a copious pale yellow precipitate, which feems to be purer tannin than can be got by any other procefs.

Medical ufe.—An infufion or decoction of galls may be ufed with advantage as an aftrinent gargle; and an ointment of one part of finely powdered galls to eight of any fimple ointment is applied with fuccefs in hæmorrhoidal affections.

RESINA PINI. *Ed.* *Resina ex variis pinis oleo volatile privata. Resina flava. Lond. Dub.*

Yellow rosin. Baked turpentine.

The proper turpentines contain a large proportion of volatile oil, which is often separated from them by distillation.

The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is Fidlers rosin, or Colophony; but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin by long and constant agitation, it is then called Yellow rosin.

At Queensferry, in this neighbourhood, there is a considerable turpentine work. The turpentine used comes from America. The under part of the cake of the residuum of the distillation resembles fidlers rosin, the action of the fire having entirely expelled the water and volatile oil, and rendered it slightly empyreumatic and transparent, while the upper part, from retaining some water, is opaque and yellow.

Off. prep.—Ungt. resinos, *Ed. Lond. Dub.* Emplast. simp. *Ed.* Emp. ceræ, *Lond. Dub.* Emp. picis Burgund. *Lond. Dub.* Ungt. inf. mel vesic. *Ed.* Emp. mel vesic. *Ed.* Emp. resinos, *Ed.* Emp. lith. cum resina, *Lond.* Emp. hydrarg. *Ed.* Emp. oxidi ferri rubri, *Ed.*

RHAMNUS CATHARTICUS. *Ed.* *Spina Cervina. Lond.*

Willd. g. 405, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Dumosa.*

Purging buckthorn.

Off.—Baccarum succus. The berry. The juice of the berries.

This tree, or bush, is common in hedges: it flowers in June, and ripens its fruit in September or the beginning of October. In our markets, the fruit of some other trees, as the blackberry bearing alder, and the dogberry tree, have of late been frequently mixed with, or substituted for, those of buckthorn. This abuse may be discovered by opening the berries; those of buckthorn have almost always four seeds, the berries of the alder two, and those of the dogberry only one. Buckthorn berries, bruised on white paper, stain it of a green colour, which the others do not. Those who sell the juice to the apothecaries, are said to mix it with a large proportion of water.

Medical use.—Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable

efteem as cathartics: and celebrated in dropfies, rheumatifms, and even in the gout: though in thefe cafes they have no advanage above other purgatives, but are more offenfive, and operate more feverely, than many which the fhops are furnifhed with. They generally occafion gripes, ficknefs, dry the mouth and throat, and leave a thirft of long duration. The dofe is about twenty of the frefh berries in fubftance, and twice or thrice this number in decoction; an ounce of the expreffed juice, or a drachm of the dried berries.

Off. prep.—Syr. rhamni cathart. *Ed. Lond.*

RHEUM PALMATUM. *Ed.* *Rhabarbarum. Lond. Dub.* *Willd. g.* 808, *fp.* 5. *Enneandria Monogynia.*—Nat. ord. *Oleraceæ.*

Palmated rhubarb.

Off.—Radix. The root.

THIS plant grows fpontaneoufly in China, and endures the colds of our climate.

But it is not afcertained that the Chinefe or Ruffian rhubarb is the dried root of this plant. Pallas thinks that it is obtained indifcriminately from the rheum undulatum, palmatum, and compactum, more efpecially from the firft; while Mr. Sievers, an apothecary who was fent by Catharine II, on purpofe to obtain the true rhubarb plant, and travelled for feveral years in the countries contiguous to that whence the rhubarb is brought, is of opinion, that the botanical characters of the plant which furnifhes it are ftill unknown, excepting that it is faid not to grow to a great fize, and to have round leaves, which are toothed on the edges with almoft fpinous points.

All the rhubarb of commerce is brought from the Chinefe town Sini, or Selim, by the Bucharians. It grows on the neighbouring chain of lofty mountains which ftretches to the lake Koko-Nor, between 35° and 40° north latitude. It is dug up by the poor peafants, cleaned from the earth, cut in pieces, ftrung with the bark on ftrings, and expofed to dry under cover in the fhade for a whole year, before it is again cleaned and prepared for exportation.

There is a diftinction made in commerce between the Ruffian and Chinefe rhubarb, although they both come from the fame country.

The Ruffian is dearer, and always good, as very great attention is paid both in purchafing and tranfporting it, by order of the government. In Kiachta, on the Ruffian frontier, it is received from the Bucharians by a Ruffian apothecary, who examines it. The bad is immediately burnt, and the good is freed from its bark,

woody parts, and every impurity, in the moſt careful manner. It is then ſent to Moſcow and to Peterſburgh, where it is again examined.

It is commonly in round pieces, of a reddiſh or whitiſh yellow colour, feels gritty between the teeth, and is often perforated with ſo large a hole, that many pieces have the appearance of a bark.

The Chineſe or Eaſt-Indian rhubarb is brought by ſea from Canton. It is heavier, harder, and more compact, than the other; ſeldom perforated with holes, and either in long pieces, or with two flat ſides, as if they had been compreſſed. Dr. Lewis thinks that this is leſs aromatic, but ſtronger, than the Turkey; and that it has required leſs care in drying from having been lifted when the root was leſs watery.

The general characters of good rhubarb are, its having a whitiſh or clear yellow colour, being dry, ſolid, and compact, moderately heavy; brittle; when recently broken appearing marked with yellow or reddiſh veins, mixed with white; being eaſily pulverizable; forming a powder of a fine bright yellow, having the peculiar, nauſeous, aromatic ſmell of rhubarb, and a ſub-acrid, bitteriſh, ſomewhat aſtringent taſte, and when chewed feeling gritty under the teeth, ſpeedily colouring the ſaliva, and not appearing very mucilaginous. The ſize and form of the pieces are of little conſequence; only we muſt break the large ones, to ſee that they are not decayed or rotten within; and we muſt alſo obſerve that they are not muſty or worm-eaten. This is the more neceſſary, as damaged pieces are frequently ſo artfully dreſſed up, and coloured with powdered rhubarb, as to impoſe on the buyer.

The principal conſtituent of rhubarb is extractive matter, ſoluble both in alcohol and in water. By gentle decoction, it loſes above one half its weight. Rhubarb alſo contains ſome volatile odorous matter, on which its peculiar nauſeous ſmell, and its activity as a purge, depend; for when diſſipated, either by age or any preparation to which the rhubarb has been ſubjected, the powers of the medicine are almoſt deſtroyed. It alſo contains ſome tannin, and about one ſixth of its weight of oxalate of lime. Neumann got from 480 grains 180 of alcoholic, and afterwards 170 watery extract; and inverſely, 350 watery and only 5 of alcoholic extract.

Medical uſe.—Rhubarb is a mild cathartic, which operates without violence or irritation, and may be given with ſafety even to pregnant women, and to children. In ſome people, however, it occaſions ſevere griping. Beſides its purgative quality, it is celebrated as an aſtringent, by which it ſtrengthens the tone of the

ftomach and inteftines, and proves ufeful in diarrhœa and diforders proceeding from laxity.

Rhubarb is exhibited,

1. In fubftance, in the form of powder. It operates more powerfully as a purgative in this form than in any other. The dofe for an adult is about a fcruple or upwards. On account of its great bulk, it is fometimes unpleafant to take a fufficient dofe; its laxative effects are therefore often increafed by the addition of neutral falts or other more active purgatives. In fmaller dofes it often proves an excellent ftomachic.

2. In infufion. Rhubarb yields more of its purgative property to water than to alcohol. The infufion is, however, confiderably weaker than the powder, and requires double the dofe to produce the fame effect. It is well adapted for children, but muft be always frefh prepared.

3. In tincture. On account of the ftimulating nature of the menftruum, this preparation frequently cannot be exhibited in dofes large enough to operate as a purgative. Its principal ufe is as a tonic and ftomachic.

The virtues of rhubarb are deftroyed by roafting, boiling, and in forming the extract.

Off. prep.—Inf. *Ed.* Vin. *Ed. Lond.* Tinct. *Ed. Lond.* Tinct. comp. *Lond.* Tinct. cum aloe, *Ed.* Tinct. cum gentian, *Ed.* Pil. comp. *Ed.*

RHODODENDRON CHRYSANTHUM. *Ed.*

Willd. g. 867, *fp.* 7. *Decandria Monogynia.*—Nat. ord. *Bicornes.*

Yellow-flowered rhododendron.

Off.—Folia. The leaves.

This fmall fhrub grows in the coldeft fituations, and higheft parts of the fnow-covered mountains in Eaft Siberia, and efpecially in Dauria. The leaves are oblong, rigid, reflected at the edges, rough on the upper furface, fmooth, and paler on the lower. When dried, they have no fmell, but a rough, aftringent, and bitterifh tafte. They alfo contain a ftimulant narcotic principle; for they increafe the heat of the body, excite thirft, and produce diaphorefis, or an increafed difcharge of the other fecretions or excretions; and in a larger dofe, inebriation and delirium.

Medical ufe.—In decoction, it is ufed in Siberia in rheumatifm and gout. About two drachms of the dried fhrub are infufed in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and the infufion taken in the morning. Befides its other effects, it is faid to produce a fenfation of prickling or creeping in the pained parts; but in a few

hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as vomiting is apt to be induced.

RHUS TOXICODENDRON. *Ed.*

Willd. g. 566, *sp.* 17. *Pentandria Trigynia.*—Nat. ord. *Dumosæ.*

Poison oak.

Off.—Folia. The leaves.

THIS is a deciduous shrub of moderate growth, a native of North-America. The leaves are alternate, and stand upon very long leaf-stalks. Each leaf consists of three leafits. It is said that its juice is so extremely acrid as to cause inflammation, and sometimes even sphacelation, in the parts touched with it.

Medical use.—It was first tried as a medicine by Dr. Alderson of Hull, in imitation of the experiments of M. Fresnoi with the rhus radicans. He gave it in four cases of paralysis, in doses of half a grain, or a grain, three times a-day, and all his patients recovered, to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytic limbs. We have given it in larger doses, without experiencing the same success. It was not, however, inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

RIBES.

Willd. g. 445. *Pentandria Monogynia.*—Nat. ord. *Pomaceæ.*

Sp. 1. RIBES RUBRUM. *Lond. Dub.*

Red currant.

Off.—Fructus. The fruit.

THIS shrub grows wild in England, and is very generally cultivated for the sake of its pleasant sub-acid fruit. The juice of the fruit contains saccharine matter, malic and citric acids, and a substance scarcely soluble in cold water, very soluble in hot water, and coagulating into the form of a jelly as it cools. By boiling currant juice with a sufficient quantity of sugar to absorb the acid watery parts, the whole forms, on cooling, an uniform jelly, which is often used as an acid demulcent in sore throats; and, dissolved in water, forms a pleasant cooling drink in feverish complaints.

Sp. 8. RIBES NIGRUM. *Lond. Dub.*
Black currant.
Off.—Fructus. The fruit.

THIS is alfo a native fhrub, which is likewife frequently cultivated for the fame purpofes with the former variety, and indeed is preferred to it for medical ufe.

Off. prep.—Syr. fucci fructus rib. nig. *Lond.* Succus fpiffat. *Lond.*

RICINUS COMMUNIS. *Ed. Lond. Dub.*
Monoecia Monadelphia.—Nat. ord. *Triccocæ.*
Palma Chrifti.
Off.—Semen, et ejus oleum fixum. The feeds, and the fixed oil obtained from them. Caftor oil.

THIS plant grows in both Indies, Africa, and the fouth of Europe. It is of fpeedy growth, and in one year arrives at its full height, which feldom exceeds twenty feet. The capfules are prickly and triangular, and contain, under a thin, dry, grey, and black-marbled hufk, a white oily kernel. The fkin is extremely acrid; and one or two of the feeds fwallowed entire operate as a draftic purgative or emetic.

The kernels yield almoft a fourth part of their weight of a bland fixed oil, commonly called Caftor oil. It is obtained from them either by expreffion or by decoction with water. The former method is practifed in Europe, the latter in Jamaica. To increafe the product, it is common to parch the feeds over the fire, before the oil is extracted from them; but the oil thus obtained is inferior to that prepared by cold expreffion or fimple decoction, and is apt to become rancid.

Off. prep.—Oleum fixum, *Lond.*

Genuine caftor oil is thick and vifcid, of a whitifh colour, infipid or fweetifh to the tafte, and without fmell.

Medical ufe.—As a medicine, it is a gentle and ufeful purgative: it in general produces its effects without griping, and may be given with fafety where acrid purgatives are improper, as in colic, calculus, gonorrhea, &c.: fome likewife ufe it as a purgative in worm cafes. Half an ounce or an ounce commonly anfwers with an adult, and a drachm or two with an infant.

The averfion to fwallowing oil is generally fo great, that different modes of taking it have been propofed. Some prefer taking it fwimming on a glafs of water, or peppermint water, or in the form of emulfion, with mucilage, or with the addition of a little rum.

ROSA.
Willd. g. 997. *Icofandria Polygynia.*—Nat. ord. *Senticofæ.*

Sp. 16. Rosa Gallica. *Ed.* *Rofa rubra. Lond. Dub.*
Red rofe.
Off.—Petala. The petals.

This has not the fragrance of the fucceeding fpecies; but the beautiful colour of its petals, and their pleafant aftringency have rendered them officinal. It muft, however, be remarked that their odour is increafed by drying, while that of the damafk rofe is almoft deftroyed.

Off. prep.—Syr. rofæ Gallicæ, *Ed.* Mel. rofæ, *Lond. Dub.* Infuf. *Ed. Lond. Dub.* Conferva, *Ed. Lond. Dub.*

Sp. 17. Rosa Damascena. *Lond. Dub.* *Rofa centifolia. Ed.*
Damafk rofe.
Off.—Petala. The petals.

The native country of this fhrub is unknown, but the delightful fragrance of its flowers has rendered it the favourite ornament of every garden. In the former editions of Linnæus, the damafk rofe was confidered as a variety only of the rofa centifolia; but Aiton, Du Roy, and Willdenow have arranged it as diftinct fpecies. It is, however, highly probable, that the petals of all the varieties of the rofa centifolia, or Dutch hundred-leaved rofe, Willdenow's 15th fpecies, are employed indifcriminately with thofe of the real damafk rofe in the diftillation of rofe water.

Off. prep.—Syr. rofæ centifoliæ, *Ed. Lond.* Aq. diftil. *Ed. Lond. Dub.*

Sp. 31. Rosa Canina. *Ed.* *Cynofbatus. Lond.*
Dog rofe.
Off.—Fructus recens. The fruit called Hips.

This fhrub is found in hedges throughout Britain. The pulp of the fruit, befides faccharine matter, contains citric acid, which gives it an acid tafte. The feeds, and ftiff hair with which they are furrounded, muft be carefully removed from the pulp before it can be ufed.

Off. prep.—Conferva, *Ed. Lond.*

ROSMARINUS OFFICINALIS. *Ed.* *Ros marinus. Lond. Rofmarinus. Dub.*

Willd. g. 62, *fp.* 1. *Diandria Monogynia.*—Nat. ord. *Verticillatæ.*

Rofemary.

Off.—Summitas florens. The herb and flowers.

ROSEMARY is a ſhrubby perennial, which grows wild in the ſouth of Europe, and is cultivated in our gardens. It has a fragrant ſmell, and a warm pungent bitteriſh taſte, approaching to thoſe of lavendar: the leaves and tender tops are ſtrongeſt; next to theſe the cup of the flower; the flowers themſelves are conſiderably the weakeſt, but moſt pleaſant.

Medical uſe.—Its virtues depend entirely on its eſſential oil, which ſeems to be combined with camphor, not only from its peculiar taſte, but from its poſſeſſing chemical properties, which depend on the preſence of camphor; and from its depoſiting cryſtals of camphor when long kept.

Off. prep.—Ol. vol. *Ed. Lond. Dub.* Spiritus, *Ed. Lond.*

RUBIA TINCTORUM. *Ed.* *Rubia. Lond. Dub.*

Willd. g. 187, *ſp.* 1. *Tetrandria Monogynia.*—Nat. ord. *Stellatæ.*

Madder.

Off.—Radix. The root.

MADDER is perennial, and grows wild in ſome parts of Britain, but the dyers are principally ſupplied with it from Zealand, where it is cultivated in large quantities.

The roots conſiſt of articulated fibres, about the thickneſs of a quill, which are red throughout, have a weak ſmell, and a bitteriſh aſtringent taſte. For the uſe of the dyers, they are firſt peeled and dried, then bruiſed and packed in barrels. Madder poſſeſſes the remarkable property of tinging the urine, milk, and bones, of animals which are fed with it, of a red colour.

Med. uſe.—It is ſaid to be uſeful in the atrophy of children, and ſome believe in its reputed powers as an emmenagogue.

It is given in ſubſtance in doſes of half a drachm, ſeveral times a-day, or in decoction.

RUBUS IDÆUS. *Lond. Dub.*

Willd. g. 998, *ſp.* 4. *Icoſandria Polygynia.*—Nat. ord. *Senticoſæ.*

Raſpberry.

Off.—Fructus. The fruit.

THIS ſhrub is found wild in Britain, and is much cultivated for the ſake of its pleaſant ſub-acid fruit, which contains both citric and malic acid.

Off. prep.—Syr. ſucci fructus rub. idæi, *Lond.*

RUMEX ACETOSA. *Ed.* *Acetoſa pratenſis. Lond.* *Acetoſa. Dub.*

Willd. g. 699, *ſp.* 31. *Hexandria Trigynia.*—Nat. ord. *Oleraceæ.*

Sorrel.

Off.—Folium. The leaves.

SORREL is a perennial plant, which grows wild in fields and meadows throughout Britain. The leaves have an aſtringent acid taſte, without any ſmell or particular flavour: their medical effects are, to cool, quench thirſt, and promote the urinary diſcharge: a decoction of them in whey affords an uſeful and agreeable drink in febrile or inflammatory diſorders.

All theſe effects are to be aſcribed entirely to the ſuper-oxalate of potaſs which they contain.

RUTA GRAVEOLENS. *Ed.* *Ruta. Lond. Dub.*

Willd. g. 927, *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Multiſiliquæ.*

Rue.

Off.—Herba. The herb.

THIS is a ſmall ſhrubby plant, a native of the ſouth of Europe, and cultivated in our gardens.

Rue has a ſtrong ungrateful ſmell, and a bitteriſh penetrating taſte: the leaves, when in full vigour, are extremely acrid, inſomuch as to inflame and bliſter the ſkin, if much handled. Neumann got from 960 grains of the dried leaves 330 alcoholic extract, and afterwards 290 watery; and inverſely, 540 watery and 40 alcoholic. Both primary extracts are bitter and acrid. Rue alſo contains a volatile oil, which congeals readily, and is obtained in greateſt quantity by diſtilling the plant with the ſeeds half ripe.

Medical uſe.—With regard to its medical virtues, like other remedies, of which the active conſtituent is an eſſential oil, it is heating and ſtimulating, and hence it is ſometimes ſerviceable in ſpaſmodic affections, and caſes of obſtructed ſecretions.

Off. prep.—Ol. volat. *Dub.* Extract, *Ed. Lond. Dub.* Pulv. myrrh. comp. *Lond.*

SACCHARUM OFFICINARUM.

Willd. g. 122, *ſp.* 4. *Triandria Digynia.*—Nat. ord. *Gramina.*

a. *Saccharum non purificatum.* Lond. Ed. *Saccharum rubrum.* Dub.

b. *Saccharum purificatum.* Lond. Dub. *Saccharum puriſſimum.* Ed.

c. *Sacchari rubri ſyrupus.* Dub.

Sugar-cane. Raw or brown ſugar. Double refined ſugar. Molaſſes.

The ſugar-cane grows wild in both Indies, and forms the chief object of cultivation in the Weſt Indies.

Sugar, of which we have already noticed the general properties, is principally obtained from this plant, by boiling down its expreſſed juice, with the addition of a certain proportion of lime or potaſs, until the greater part is diſpoſed to concrete into browniſh or yellowiſh cryſtalline grains. The lime or potaſs is added to ſaturate ſome malic acid, whoſe preſence impedes the cryſtallization. The *molaſſes*, or that portion of the inſpiſſated juice which does not cryſtallize, is ſeparated from the *raw ſugar*, which is ſent to Europe to be refined. This is performed by diſſolving it in water, boiling the ſolution with lime-water, clarifying it with blood or white of eggs, and ſtraining it through woollen bags. The ſolution, after due evaporation, is permitted to cool to a certain degree, and then poured into conical forms of unglazed earthen ware, where it concretes into a maſs of irregular cryſtals. The ſyrup which has not cryſtallized is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moiſt clay, the water of which gradually penetrates into the ſugar, and diſplaces a quantity of ſyrup, which would otherwiſe be retained in it, and diſcolour it. It is then carefully dried, and gets the name of *loaf* or *lump ſugar*. When the ſolution and other ſteps of the proceſs are repeated, the ſugar is ſaid to be *double refined*. Sugar is ſometimes made to aſſume a more regular form of cryſtallization, by carrying the evaporation only a certain length, and then permitting the ſyrup to cool ſlowly. In this form it is called *Brown or White ſugar candy*, according to the degree of its purity.

Raw ſugar varies very much in quality. It ſhould be dry, cryſtallized in large ſparkling grains, of a whitiſh or clear yellow colour, without ſmell, and of a ſweet taſte, without any peculiar flavour.

Refined ſugar ſhould have a brilliant white colour, and a cloſe compact texture. It ſhould be very hard, but brittle, and break with ſharp, ſemi-tranſparent, ſplintery fragments.

Medical uſe.—Sugar, from being a luxury, has now become one of the neceſſaries of life. In Europe ſugar is almoſt ſolely uſed as a condiment. But it is alſo a very wholeſome and powerful article of nouriſhment; for during crop time, the negroes in the Weſt Indies, notwithſtanding their increaſed labours, always grow fat. It is in this way alſo that its internal employment is uſeful in ſome diſeaſes, as in ſea ſcurvy; for ſugar produces no particular effect as a medicine, except that the coarſer and impure kinds are ſlightly purgative. Applied externally it acts as an eſcharotic in ſpongy and unhealthy granulations; and to abraded

or inflamed ſurfaces it proves gently ſtimulant. In pharmacy it is principally employed to cover bad taſtes, to give form to, and to preſerve more active ſubſtances. In uſing it for the laſt purpoſe, we muſt always remember, that if the proportion of ſugar employed be too ſmall, it will promote inſtead of retarding the fermentation of the articles it is intended to preſerve.

Off. prep.—Syrupi omnes, *Ed. Lond. Dub.* Succus ſpiſſat. ſamb. nigri, *Ed.* Miſtura moſchata, *Lond.* Potio carbonat. calcis, *Ed. Lond. Dub.* Pulv. ſcam. cum calomel, *Lond.* Pulv. trag. comp. *Lond.* Elect. Caſſiæ ſennæ, *Ed. Lond.* Elect. aromat. *Dub.* Confect. aromat. *Lond.* Trochiſci carb. calcis, *Ed. Lond.* Troch. glycyrr. *Lond. Dub. Ed.* Troch. gummoſi, *Ed. Lond.* Troch. magn. *Lond.* Troch. nitrat. pot. *Ed. Lond.* Troch. ſulph. *Lond.*

Molaſſes or treacle is a very impure ſyrup. It is thick, viſcid, of a dark brown, almoſt black colour, and has a peculiar ſmell, and a ſweet, ſomewhat empyreumatic taſte. Treacle is applied to many domeſtic and economical purpoſes; and in hoſpital practice may ſuperſede the uſe of ſugar in many inſtances.

Off. prep.—Elect. ſennæ, *Dub.*

SAGAPENUM. *Gummi-reſina. Lond. Dub. Ed.*

Sagapenum. A gum-reſin.

THE plant which furniſhes this ſubſtance is not aſcertained, but is conjectured by Willdenow to be the Ferula Perſica.

Sagapenum is a concrete juice brought from Alexandria, either in diſtinct tears, or agglutinated in large maſſes. It is outwardly of a yellowiſh colour; internally, ſomewhat paler, and clear like horn; it grows ſoft upon being handled, and ſticks to the fingers; its taſte is hot, nauſeous, and bitteriſh, and its ſmell diſagreeable and alliaceous.

Neumann got from 480 grains, 306 alcoholic, and 108 watery, extract, and inverſely 170 watery, and 241 alcoholic, extract. The alcohol diſtilled from it was ſenſibly impregnated with its flavour, and along with the water a conſiderable portion of volatile oil aroſe. It is not fuſible.

Medical uſe.—In medical virtues it holds a kind of middle place between aſſa fœtida and galbanum, and may be employed in the ſame manner, and under ſimilar circumſtances.

Off. prep.—Pil. galb. comp. *Lond.*

SALIX FRAGILIS. *Salix. Dub.*

Dioecia Diandria.—Nat. ord. *Amentaceæ.*

Crack-willow.

Off.—Cortex. The bark.

This willow grows wild in England. The bark poſſeſſes a conſiderable degree of bitterneſs and aſtringency. Different ſpecies of willow have at different times been recommended as ſubſtitutes for the Peruvian bark: they are certainly powerful aſtringents, but in point of efficacy in the cure of diſeaſe, they are in no degree to be compared with the Peruvian bark, from which they differ in containing no cinchonin.

SALVIA OFFICINALIS. *Ed.* *Salvia. Lond. Dub.*
Willd. g. 63, ſp. 7. Diandria Monogynia.—Nat. ord. *Verticillatæ.*

Sage.

Off.—Folium. The leaves.

Sage is a perennial plant, a native of the ſouth of Europe, and cultivated in our gardens. There are ſeveral varieties of it, differing in ſize, or in the colour of its flower, but their properties are the ſame. They have a peculiar aromatic ſmell, and a warm aromatic taſte, with ſome degree of bitterneſs and aſtringency.

Medical uſe.—In its effects ſage agrees with other aromatics. It is ſtimulant, carminative, and tonic. In cold phlegmatic habits, it excites appetite, and proves ſerviceable in debilities of the nervous ſyſtem. The beſt preparation for theſe purpoſes is an infuſion of the dried leaves, drunk as tea; or a tincture, or extract, made with rectified ſpirit, taken in proper doſes; theſe contain the whole virtues of the ſage; the diſtilled water and eſſential oil only its warmth and aromatic quality, without any of its roughneſs or bitterneſs. Aqueous infuſions of the leaves, with the addition of a little lemon-juice, prove an uſeful diluting drink in febrile diſorders, being ſufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Ed.* *Sambucus. Lond. Dub.*
Willd. g. 569, ſp. 3. Pentandria Trigynia.—Nat. ord. *Dumoſæ.*

Common elder.

Off.—Flos, Bacca, Cortex. The inner bark, flowers, and berries.

This tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a ſweetiſh, not unpleaſant, taſte; nevertheleſs, eaten in ſubſtance, they offend the ſtomach. For the market they are gathered indiſcriminately from the Sambucus nigra and ebulus, a very venial fraud, as their effects are exactly the ſame. They are, however, eaſily diſtinguiſhed, by the latter, when bruiſed, ſtaining the fingers of a red colour, and the former of the colour of a withered leaf.

Med. uſe.—The expreſſed juice, inſpiſſated to the conſiſtence of a rob, proves an uſeful aperient medicine; it opens obſtructions of the viſcera, promotes the natural evacuations, and, if continued for a length of time, does conſiderable ſervice in various chronical diſorders. The inner green bark of its trunk is gently cathartic. An infuſion of it in wine, or the expreſſed juice, in the doſe of half an ounce or an ounce, is ſaid to purge moderately, and in ſmall doſes to prove an efficacious deobſtruent, capable of promoting all the fluid ſecretions. The young leaf buds are ſtrongly purgative, and act with ſo much violence as to be deſervedly accounted unſafe. The flowers are very different in quality: theſe have an agreeable aromatic flavour, which they yield in diſtillation to water, and impart by infuſion to vinous and ſpiritous liquors.

Off. prep.—Succus ſpiſſat. *Lond. Ed.* Ungt. ſambuci, *Lond. Dub.*

SAPO.

Sapo ex oleo olivarum et ſoda confectus. Ed. *Sapo ex oleo olivæ et natro confectus.* Lond. *Sapo durus Hiſpanicus.* Dub.

Soap. Spaniſh hard ſoap.

THE general chemical properties of ſoap have been already noticed. The only ſpecies which is officinal in our pharmacopœias, is that compoſed of olive oil and ſoda. It is only prepared in the countries which produce the oil. For medicinal uſe we prefer the Spaniſh.

It ſhould be white and hard, diſſolve entirely in water and in alcohol, forming with the former a milky, and with the latter a tranſparent ſolution; and the ſolutions ſhould froth freely on agitation. It ſhould not be variegated in its colour, feel greaſy or moiſt, or be covered with a ſaline efflореſcence; and the ſolutions ſhould not have a rancid ſmell or taſte. Some of the foreign Diſpenſatories are ſo very particular about the nature of the ſoap uſed in medicine, as to direct it to be prepared by the apothecary, by ſimply triturating, without the aſſiſtance of heat, Provence oil, with half its weight of a ſolution of ſoda, of the ſpecific gravity of 1.375, until they unite.

Soap is decompoſed by all the acids, earths, and earthy and metalline ſalts. The acids combine with the alkali, and ſeparate the oil. The earths form an inſoluble earthy ſoap with the oil, and ſeparate the alkali; while with the ſalts there is a mutual decompoſition, their acid combines with the alkali, and earthy or metalline ſoaps are formed.

Med. uſe.—The detergent property of ſoap, or the power it poſſeſſes of rendering oily and reſinous ſubſtances miſcible with water, has given riſe to very erroneous notions of its medical

virtues. It was ſuppoſed to render ſuch ſubſtances more readily ſoluble in the juices of the ſtomach, and in the fluids of the body, and to be well fitted for diſſolving ſuch oily or unctuous matters as it may meet with in the body, attenuating viſcid juices, opening obſtructions of the viſcera, and deterging all the veſſels it paſſes through. It has likewiſe been ſuppoſed a powerful menſtruum for the urinary calculus; and a ſolution of ſoap in lime-water, has been conſidered as one of the ſtrongeſt diſſolvents that can be taken with ſafety into the ſtomach; for the virtue of this compoſition has been thought conſiderably greater than the aggregate of the diſſolving powers of the ſoap and lime-water when unmixed.

How erroneous theſe ideas are, appears evidently, when we recollect the very eaſy decompoſition of ſoap, which renders it perfectly impoſſible that it ſhould enter the circulating ſyſtem, or indeed come into contact with the fluids even of the mouth, without being decompoſed. As to the ſolution of ſoap in lime-water, we may obſerve, that it is only a clumſy way of exhibiting a ſolution of ſoda; for the ſoap is decompoſed, an inſoluble ſoap of lime is formed, and the ſoda remains in ſolution. The internal uſe of ſoap ſhould therefore be confined, in our opinion, to the giving form to other ſubſtances which are not decompoſed by it, and to decompoſe metallic poiſons when they have been taken into the ſtomach. For this laſt purpoſe, a tea cupful of a ſolution of ſoap, in four times its weight of water, may be drunk every three or four minutes, until a ſufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the ſtimulating properties of the alkali with the lubricitating nature of the oil. In this way it often proves a powerful diſcutient, and a uſeful application to ſprains and bruiſes.

Off. prep.—Tinct. *Ed.* Tinct. cum opio, *Ed.* Linim ſap. *Lond. Dub.* Sp. am. ſuccin. *Lond.* Pil aloet, *Ed.* Pil aloes cum aſſa fœtid. *Ed.* Pil ſcill. *Lond. Dub.* Pil ſtib. comp. *Dub.* Cerat ſaponis, *Lond. Dub.* Emp. ſap. *Lond. Dub. Ed.*

SCILLA MARITIMA. *Ed.* *Scilla. Lond. Dub.*

Willd. g. 640, *ſp.* 1. *Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

Squill.

Off.—Radix. The root.

THE ſquill is a perennial bulbous-rooted plant, which grows wild on the ſandy ſhores of Spain, Portugal, north of Africa, and the Levant.

The root is about the ſize of the fiſt, pear-ſhaped, with the apex upwards, and conſiſts of fleſhy ſcales, attenuated at both edges, ſurrounded by other ſcales, which are arid, ſhining, and

ſo thin that the root at firſt ſight ſeems to be tunicated. The recent roots are full of a white viſcid juice, have ſcarcely any ſmell, but a very bitter, nauſeous, and extremely acrid, taſte. Rubbed on the ſkin, it inflames and bliſters.

It is more commonly met with in the ſhops, in the form of the dried ſcales, which ſhould be brittle, ſemipellucid, ſmooth, but marked with lines, and when chewed, ſhould feel tenacious, and taſte very bitter, without manifeſt acrimony.

The active conſtituent of the ſquill is the acrid principle; and, therefore, it becomes almoſt inert by too much drying, or by being kept too long in the form of powder. It alſo contains bitter extractive, much mucilage, albumen, and ſtarch.

Medical uſe.—Given internally in large doſes, it produces purging and vomiting, ſometimes even ſtranguary, bloody urine, inflammation and eroſion of the ſtomach. In ſmaller doſes it proves a uſeful expectorant and diuretic, and it is ſaid to leſſen the frequency of the pulſe.

Squill is ſometimes given as a general ſtimulant in typhus, eſpecially to cattle. But it is much more frequently exhibited as an expectorant where the lungs are loaded with viſcid matter, and as a diuretic in dropſical caſes, for which purpoſe it is commonly conjoined with calomel.

The doſe of ſquill is one or two grains three or four times a-day; and the moſt commodious form for the taking of ſquills, unleſs when deſigned as an emetic, is that of a bolus, or pill: liquid forms are to moſt people too offenſive, though theſe may be rendered leſs diſagreeable both to the palate aud ſtomach by the addition of aromatic diſtilled waters.

Off. prep.—Syrupus ſcillæ maritimæ, *Ed.* Mel. ſcillæ, *Lond. Dub.* Oxymel ſcillæ, *Lond.* Scill. mar. exſiccat, *Ed. Lond. Dub.* Acet. ſcillæ, *Lond. Dub.* Conſerva, *Lond.* Tinctura, *Lond. Dub.* Pil, *Ed. Lond. Dub.*

SINAPIS.

Willd. g. 1246. *Tetradynamia Siliquoſa.*—Nat. ord. *Siliquoſæ.*

Sp. 4. Sinapis Alba. *Ed.* *Sinapis, Dub.*
White muſtard.
Off.—Semen. The ſeeds.

Sp. 5. Sinapis Nigra. *Sinapis. Lond.*
Common muſtard.
Off.—Semen. The ſeeds.

These plants are both annual, both grow wild in England, and poſſeſs ſimilar virtues.

They produce ſmall round compreſſed ſeeds, which have an

acrid bitteriſh taſte, and a pungent ſmell when reduced to powder. The common muſtard has blackiſh ſeeds, and is more pungent than the white.

They impart their taſte and ſmell in perfection to aqueous liquors, whilſt rectified ſpirit extracts extremely little of either: the whole of the pungency ariſes with water in diſtillation. Committed to the preſs, they yield a conſiderable quantity of a ſoft inſipid oil, perfectly void of acrimony: the cake left after the expreſſion, is more pungent than the muſtard itſelf.

Medical uſe.—Muſtard-ſeed is ſwallowed entire, to the quantity of a table ſpoonful or more, to ſtimulate the ſtomach in ſome caſes of dyſpepſia, and to excite the periſtaltic motion of the inteſtines, eſpecially when they are torpid, as in paralyſis. The powder made into a paſte with water, is commonly uſed as a condiment with animal food; infuſed in water, it proves emetic when taken in conſiderable doſes, and in ſmaller ones, acts as a diuretic and aperient; but it is more frequently applied externally as a topical ſtimulus, made into a paſte or ſinapiſm with vinegar and bread-crumb.

Off. prep.—Oleum fixum, *Lond. Dub.* Cataplaſma, *Lond. Dub.* Emp. mel. veſic. comp. *Ed.*

SISYMBRIUM NASTURTIUM. *Ed. Naſturtium aquaticum. Lond. Dub.*

Willd. g. 1238, *ſp.* 1. *Tetradynamia Siliquoſa.*—Nat. ord. *Siliquoſæ.*

Common water-creſſes.

Off.—Herba. The recent herb.

THIS plant is perennial, and grows wild in clear ſprings and rivulets throughout Britain. Its leaves remain green all the year, but are in greateſt perfection in the ſpring. They have a quick pungent ſmell (when rubbed betwixt the fingers), and an acrid taſte, ſimilar to that of ſcurvy-graſs, but weaker. By drying or boiling, it loſes its ſenſible qualities entirely.

Medical uſe.—It acts as a gentle ſtimulant and diuretic: for theſe purpoſes, the expreſſed juice, which contains the peculiar taſte and pungency of the herb, may be taken in doſes of an ounce or two, and continued for a conſiderable time.

SIUM NODIFLORUM *Sium. Lond.*

Willd. g. 544, *ſp.* 4. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Creeping ſkerrit.

Off.—Herba. The herb.

THIS plant is perennial, and grows wild in rivers and ditches

in England. It was formerly alleged to be not only diuretic, but alſo emmenagogue and lithontriptic. With theſe intentions, however it is not now employed.

SMILAX SARSAPARILLA. *Ed. Sarſaparilla. Lond. Dub.*
Diœcia Hexandria.—Nat. ord. *Sarmentaceæ.*
Sarſaparilla.
Off.—Radix. The root.

THIS root is brought from the Spaniſh Weſt Indies. It conſiſts of a great number of long ſtrings hanging from one head: the long roots, the only part made uſe of, are of a blackiſh colour on the outſide, and white within, about the thickneſs of a gooſe-quill, or thicker, flexible, compoſed of a very ſmall woody heart, ſurrounded with fibres running their whole length, which renders them extremely apt to ſplit. They have a glutinous, bitteriſh, not ungrateful taſte, and no ſmell. Inferior kinds of this root are alſo ſold. They are in general thicker, of a paler colour on the outſide, and leſs white within, with a much thicker woody heart. Neumann got from 960 grains, 360 watery, and 10 alcoholic, extract, and inverſely 240 alcoholic, and 120 watery.

Medical uſe—It was firſt brought into Europe by the Spaniards, about the year 1563, with the character of being a ſpecific for the cure of the lues venerea, a diſeaſe which made its appearance a little before that time, and likewiſe of ſeveral obſtinate chronic diſorders. It is, however, a very inert mucilaginous ſubſtance; and the diaphoreſis, which it is ſometimes ſuppoſed to produce, is entirely owing to the warm and diluent regimen employed at the ſame time.

Off. prep.—Decoct. *Ed. Lond. Dub.*

SOLANUM DULCAMARA. *Dulcamara. Dub.*
Willd. g. 383, *ſp.* 15. *Pentandria Monadelphia.*—Nat. ord. *Solanaceæ.*
Bitter-ſweet.
Off.—Stipites. The twigs.

THIS plant grows wild in moiſt hedges, has woody brittle ſtalks, and climbs on the buſhes. The twigs ſhould be gathered early in ſpring. The taſte, as the name of the plant expreſſes, is both bitter and ſweet; the bitterneſs being firſt perceived, and the ſweetneſs afterwards; and when freſh they have a nauſeous ſmell.

Med. uſe.—The dulcamara was formerly much eſteemed as a powerful medicine. It is in general ſaid to increaſe all the evacuations; and in large doſes, to produce nauſea, vomiting, and convulſions; but its effects ſeem to differ according to the nature of

the ſoil on which it grows. It has been recommended in cutaneous and venereal affections, in rheumatic and cathartic ſwellings, in ill-conditioned ulcers, ſcrophula, indurations from milk, leucorrhœa, jaundice, and obſtructed menſtruation. It has principally been employed under the form of the watery infuſion, of a ſcruple taken daily, and gradually increaſed to two ounces. In the form of extract from 5 to 10 grains may be given for a doſe.

SOLIDAGO VIRGA AUREA. *Virga aurea. Dub.*
Willd. g. 1483, *ſp.* 35. *Syngeneſia Superflua.*—Nat. ord. *Compoſitæ radiatæ.*

Golden-rod.

Flos, folium. The flowers and leaves.

This plant is perennial, and is found wild on heaths and in woods, producing ſpikes of yellow flowers in Auguſt. The leaves have a moderately aſtringent bitter taſte; and thence prove ſerviceable in debility and laxity of the viſcera, and diſorders proceeding from that cauſe.

SPARTIUM SCOPARIUM. *Ed. Geniſta. Lond. Dub.*
Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Common broom.

Off.—Summitas, ſemen. The tops and ſeeds.

This is a very common ſhrub on dry paſtures.

The leaves have a very bitter taſte, and when given in decoctions prove conſiderably diuretic. The ſeeds have ſimilar properties.

Off. prep.—Extract, *Lond.*

SPIGELIA MARILANDICA. *Ed. Spigelia. Lond. Dub.*
Wild. g. 308, *ſp.* 2. *Pentandria Monogynia.*—Nat. ord. *Stellatæ.*

Carolina pink.

Off.—Radix. The root.

This plant is perennial, and grows wild in the ſouthern parts of North America. The roots are celebrated as anthelmintic, particularly for the expulſion of lumbrici from the alimentary canal. Some order it in doſes of ten or fifteen grains; and allege it is apt to occaſion nervous affections if given in large doſes; while others order it in drachm doſes, alleging that the bad effects mentioned more readily happen from ſmall doſes, as the large ones often purge or puke; ſome prefer the form of infuſion. An emetic is generally premiſed; and its purgative effect is aſſiſted by ſome ſuitable additions.

SPONGIA OFFICINALIS. *Ed.* *Spongia.* *Lond. Dub.*
Cl. *Zoophyta.* Ord. *Spongia.*
Sponge.

SPONGE is principally found in the Mediterranean and Red ſeas. It was long ſuppoſed to be a vegetable production, but it is now univerſally allowed to belong to that remarkable claſs of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no ſanguiferous veſſels, no ſpinal marrow, and no articulated limbs. The ſponges belong to that diviſion of the zoophytes, which are attached to a ſolid trunk, and are particularized by their baſe being ſpongy, friable, or fibrous.

Sponge is a ſoft, light, very porous and compreſſible ſubſtance, abſorbing by capillary attraction a large proportion of any fluid in which it is immerſed.

Med. uſe.—From theſe properties it is an uſeful ſubſtance in the practice of ſurgery. When applied to ulcers which are accompanied with a copious diſcharge, it abſorbs the thinner and more acrid fluid, and leaves the ulcers covered with the thicker and blander matter. It is alſo uſeful in ſuppreſſing hæmorrhagies, when properly applied by compreſſion, by favouring the coagulation of the blood at the mouths of the veſſels. It alſo forms a convenient tent for dilating wounds and fiſtulous ulcers, eſpecially when prepared by immerſing it in melted wax, and keeping it compreſſed until it cools. On the melting of the wax by the heat of the part to which it is applied, it gradually expands, and affords an uniform and gently dilating preſſure.

Burnt ſponge is nothing elſe than charcoal mixed with a little muriate of ſoda and phoſphate of lime.

Off prep.—Spongia uſta, *Lond. Dub.*

STALAGMITIS CAMBOGIOIDES. Murray. *Gambogia. Ed. Lond. Dub.*
Polygamia Monæcia.—Nat. ord. *Tricoccæ.*
Gamboge.
Off.—Gummi-reſina. The gum-reſin, called Gamboge.[1]

THE tree which furniſhes the gamboge is of middling ſize, and grows wild in the kingdom of Siam and in Ceylon. In Siam the gum-reſin is obtained in drops by breaking the leaves and young ſhoots; hence probably its name Gummi-guttæ; but in Ceylon it is extracted from the wood of the tree in the form of a juice, which ſoon becomes ſolid. Gamboge, or at leaſt a very ſimilar ſubſtance, is alſo got in the ſame way from different ſpecies of Garcinia; eſpecially the Gambogia, (the Gambogia Gutta of Lin.) *Willd. g.* 938, *ſp.* 3. *Dodecandria Monogynia,* and from different

ſpecies of hypericum, eſpecially the bacciferum. It is brought from the Eaſt Indies in large cakes or rolls. The beſt ſort has a deep yellow or orange colour, ſhining fracture, and is free from impurities. It has no ſmell, and very little taſte, unleſs kept in the mouth for ſome time, when it impreſſes a ſlight ſenſe of acrimony. Neumann got from 16 ounces, 14 of alcoholic extract, and one of watery, and inverſely 13 of watery, and two of alcoholic. He alſo found it almoſt entirely ſoluble in water, impregnated with a moderate proportion of fixed alkaline ſalt. According to my experiments, which confirm theſe obſervations, the watery ſolution is opaque and yellow. With alcohol it forms a tranſparent ſolution of a bright golden colour; and the reſiduum is totally ſoluble in water. The alcoholic ſolution is decompoſed by water, becoming yellow and opaque; but the precipitate remains long ſuſpended, and cannot be ſeparated by common filtering paper. Gamboge is readily ſoluble in ſolution of potaſs, acquiring a bright red colour the moment it is thrown into it, and forming a dark-coloured ſolution, which is not decompoſed by water, but by the addition of any acid immediately produces a copious yellow precipitate, very ſoluble in exceſs of acid. The reſiduum is ſoluble in water. Ammoniated alcohol diſſolves gamboge with ſimilar phenomena. It is alſo very ſoluble, but with decompoſition in acids. The acid ſolution is decompoſed by water.

Med. uſe.—Gamboge evacuates powerfully both upwards and downwards; ſome condemn it as acting with too great violence, and occaſioning dangerous hypercatharſis; while others are of a contrary opinion. Geoffroy ſeems particularly fond of this medicine, and informs us, that he has frequently given from two to four grains, without its proving at all emetic; that from four to eight grains both vomit and purge without violence; that its operation is ſoon over; and that if given in a liquid form, and ſufficiently diluted, it does not need any corrector; that in the form of a bolus or pill, it is moſt apt to prove emetic, but very rarely has this effect if joined along with *Calomel*. He nevertheleſs cautions againſt its uſe where the patients cannot eaſily bear vomiting.

It has been uſed in dropſy with cream of tartar or jalap, or both, to quicken their operation. It is alſo recommended by ſome to the extent of fifteen grains, with an equal quantity of vegetable alkali, in caſes of the tape-worm. This doſe is ordered in the morning; and if the worm is not expelled in two or three hours, it is repeated even to the third time with ſafety and efficacy. It is aſſerted, that it has been given to this extent even in delicate habits.

It is an ingredient, and probably the active one, in moſt of the noſtrums for expelling tæniæ.

STANNUM. *Lond. Limatura et pulvis. Dub. Ed.*

THE general properties of tin have been already mentioned. It is found,

1. Sulphuretted, and combined with copper. Tin-pyrites.
2. Oxidized.
   a. Combined with oxide of iron and silica. Common tinstone.
   b. Combined with oxide of iron and a little arsenic. Fibrous tinstone.

The best tin is found in Cornwall, or is brought from the East Indies. Its purity is estimated by its small specific gravity, and by the crackling noise it makes when bent.

It is now only used as an anthelmintic, especially in cases of tænia, and probably acts mechanically.

Off. prep.—Pulvis stanni, *Lond. Dub.*

STYRAX.

Willd. g. 874. *Decandria Monogynia.*—Nat. ord. *Bicornes.*

Sp. 1. STYRAX OFFICINALE. *Ed. Styrax. Lond. Styrax calamita. Dub.*

Storax.

Off.—Balsamum. A Balsam.

THIS tree grows in the Levant, Italy, and France. The storax flows from wounds made in the bark, in countries where the heat is sufficient, for neither in France nor in Italy does it furnish any,

It is either in small distinct tears, of a whitish or reddish colour, or in large masses composed of such, or in masses of an uniform texture and yellowish red or brownish colour; though sometimes likewise interspersed with a few whitish grains.

The *common storax* of the shops is in large masses, considerably lighter and less compact than the foregoing; it appears on examination to be composed of a fine resinous juice, mixed with a quantity of saw-dust.

Storax has an agreeable smell, and an aromatic taste. Neumann got from 480 grains, 360 alcoholic, and 30 of watery, extract, and inversely 120 watery, and 240 alcoholic. In distillation it yielded benzoic acid. It is, therefore, a balsam, or natural combination of resin with benzoic acid.

Off. prep.—Styrax purif. *Lond. Dub.* Tinct. benz. comp. *Lond. Ed.*

Sp. 3. STYRAX BENZOIN. *Ed.* *Benzoë. Lond.* *Benzoinum. Dub.*

Benzoin.

Off.—Balſamum. A balſam.

THIS ſpecies grows in Sumatra, and, like the former, alſo furniſhes a balſam on being wounded.

It is brought from the Eaſt-Indies only, in large maſſes compoſed of white and light brown pieces, with yellowiſh ſpecks, breaking very eaſily betwixt the hands: that which is whiteſt, and freeſt from impurities, is moſt eſteemed.

In its properties it differs from ſtorax, only in containing a larger proportion of benzoic acid. Neumann found that it was totally ſoluble in alcohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. By ſublimation he got two ounces of impure acid from ſixteen of benzoin. Lime and the alkaline carbonates diſſolve the acid without attacking the reſin, and are accordingly employed in the proceſſes of Scheele, Göttling, and Gren, for obtaining the benzoic acid. I find that the ſolution of potaſs diſſolves benzoin very rapidly, forming a dark coloured ſolution, mixed with fine cryſtals of benzoat of potaſs. This alkaline ſolution is not decompoſed by water, but forms with acids a roſe-coloured coagulum, eaſily ſoluble in exceſs of acid. Boiling nitrous acid alſo attacks benzoin with great violence, and diſſolves it entirely; the ſolution becomes turbid, and lets fall a copious precipitate on cooling, which, according to Mr. Brande, is benzoic acid. It is decompoſed by water, and by alkaline ſolutions.

Off. prep.—Acid benzoic, *Ed. Lond. Dub.* Tinct. benz. comp. *Ed. Lond.*

SUB-BORAS SODÆ. *Boras Sodæ. Ed.* *Borax. Lond. Dub.*

Sub-borate of ſoda. Borax.

BORAX is found only in Thibet and Perſia. It exiſts in the water of ſome wells and lakes, and is extracted from them by evaporation. In its impure ſtate it is called tincal, and is brought from the Eaſt Indies in great maſſes, compoſed of a few large cryſtals, but chiefly of ſmaller ones, partly white and partly green, joined together as it were by a greaſy yellow ſubſtance, intermixed with ſand, ſmall ſtones, and other impurities. By repeated ſolutions, filtrations, and cryſtallizations, it ſhoots into hexangular priſms, of which two ſides are broader than the others, terminated by triangular pyramids, of a white colour, a ſtyptic and alkaline taſte, colouring vegetable blues green, ſoluble in eighteen parts of water at 60°, and in ſix at 212°, ſlightly efflorеſcing in the air, and, when heated, ſwelling, and, with the loſs

of nearly half its weight, forming a porous friable mafs, which, in a greater heat, melts into a tranfparent glafs foluble in water. Befides the acids and alkalies which have a greater affinity for its acid or bafe than thefe have for each other, it is decompofed by fulphates, muriates, nitrates, phofphates, and fluates, of all the earths and of ammonia. It confifts of 39 boracic acid, 17 foda, and 44 water.

Medical ufe.—The medical virtues of borax have not been fufficiently afcertained by experience: it is fuppofed to be, in dofes of half a drachm or two fcruples, diuretic, emmenagogue, and a promoter of delivery. Mr. Biffet, in an effay on the medical conftitution of Great Britain, recommends a folution of this falt in water, as the moft powerful diffolvent yet known, of aphthous crufts in the mouth and fauces of children. And for the fame purpofe alfo, a fmall quantity of it is often applied in the form of powder mixed up with fugar. There are ftrong reafons to believe, that the virtues of borax are much greater than they are in general fuppofed to be; and that it may be more extenfively ufed with advantage.

SUCCINUM. *Ed. Lond. Dub.*

Amber.

This is a folid, brittle, bituminous, fubftance, dug out of the earth, or found upon the fea-fhores: the largeft quantities are met with along the coafts of Polifh Pruffia and Pomerania. It is of a white, yellow, or brown colour, fometimes opaque, and fometimes very clear and tranfparent.

It emits an agreeable fmell when heated or rubbed. By friction it becomes electric; and when heated it foftens, fwells, and then melts and burns with a greenifh or bluifh flame, leaving a coaly refiduum. By diftillation it affords a little acetous acid, an effential oil, and a peculiar acid, named from it the Succinic. It is not acted upon by water, or diluted acids. It is imperfectly diffolved in alcohol and ether. Hoffmann diffolved it in oil of almonds in Papin's digefter, and in a boiling folution of potafs. Dr. Thomfon lately difcovered that it was foluble in the cold, even in a very weak folution of the fub-carbonate of potafs. Heyer afcertained that it was foluble with decompofition in nitrous acid. In attempting to form fuccinic acid by the action of nitrous acid on amber, I made the fame obfervation. The acid when heated to ebullition acts violently, copious red fumes are emitted, and the amber is firft as if melted, and then diffolved. On cooling, part of the amber feparates. The acid folution is decompofed by water, and by alkaline folutions. Amber is rendered foluble in the fixed and volatile oils, by melting or roafting it, or by the addition of a little camphor.

It is only used in pharmacy for the empyreumatic oil and acid obtained from it.

Off. prep.—Acid. et ol. succini, *Lond. Ed. Dub.* Succin. ppt. *Lond.*

SULPHAS.

SULPHATE is a generic term for the combination of suphuric acid with the alkalies, earths, and metallic oxides. Their generic characters have been already noticed. Like the other genera, they may be divided into three families.

Family 1. Alkaline sulphates.—These form no precipitate with alkaline carbonates.

Family 2. Earthy sulphates.—These are either insoluble in water, or, if soluble, form a white precipitate with alkaline carbonates.

Family 3. Metalline sulphates.—These form precipitates, which are often coloured, with alkaline carbonates in general, with prussiate of potass and iron, and with gallic acid.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ. *Sulphas Aluminæ. Ed. Alumen. Lond. Dub.*

Super-sulphate of alumina and potass. Alum.

ALUM is obtained principally from schistose clays, which contain iron pyrites, by roasting, exposure, lixiviation, the addition of a proportion of potass ley, evaporation, and crystallization.

The roasting destroys the bituminous matters these clays commonly contain, the exposure to the air acidifies the sulphur of the pyrites, and the addition of alkali is absolutely necessary for the constitution of alum, which is a triple salt, with excess of acid, consisting of sulphuric acid, alumina, and potass, or ammonia, or a mixture of both. The properties of alum do not seem to be affected by the nature of the alkali. To save the trouble of evaporation, M. Curadau has given another method of manufacturing this substance. He takes 100 parts of clay, and 5 parts of muriate of soda, dissolved in as much water as is necessary to form the whole into a paste, which is made into cakes, and baked for two hours in a reverberatory furnace. The mass is then reduced to powder, and put into a good cask; a quarter of its weight of sulphuric acid is then added to it at several times, stirring it well each time. After the vapours of the muriatic acid are disengaged, an equal quantity of water with the acid is added. The mixture then becomes hot, swells, and emits very abundant vapours. When the heat is somewhat moderated, more water must be added, until there is about eight or ten times as much as of the acid. The liquor is then drawn off into leaden vessels,

and an equal quantity of water poured upon the refiduum, which is alfo drawn off and added to the former. To thefe is laftly added a folution containing as much potafs as is equal to a fourth part, or fulphate of potafs equal to one half, the weight of the acid. As the liquor cools, it affords cryftallized alum, equal in weight to three times the acid, and which may be farther purified by re-diffolving it in the fmalleft poffible quantity of boiling water, and allowing it to cryftallize.

Alum cryftallizes in regular octohedrons, whofe fides are equilateral triangles. It has a fweetifh but very aftringent tafte. It is foluble in 15 times its weight of water at 60°, and in three fourths of its weight at 212°. It reddens vegetable blues. It efflorefces flightly in the air. By the action of heat it firft undergoes the watery fufion, then lofes its water of cryftallization, and laftly great part of its acid. It is decompofed by baryta, potafs, foda, ftrontia, and all falts of which thefe are the bafes; by the nitrate, muriate, phofphate, carbonate, borate, and fluate, of ammonia; by the nitrate, muriate, phofphate, and carbonate, of magnefia; and by the nitrate, muriate, and carbonate, of lime. It is alfo decompofed by the gallic acid, by colouring matters, and by many animal and vegetable fubftances, in a manner not yet fufficiently underftood.

It commonly confifts, according to Vauquelin, of 49 fulphate of alumina, 7 fulphate of potafs, and 44 of water.

Medical ufe.—Alum is a powerful aftringent: it is reckoned particularly ferviceable for reftraining hæmorrhagies, and immoderate fecretions from the blood; but lefs proper in inteftinal fluxes. In violent hæmorrhagies, it may be given in dofes of fifteen or twenty grains, and repeated every hour or half hour till the bleeding abates: in other cafes, fmaller dofes are more advifable; large ones being apt to naufeate the ftomach, and occafion violent conftipations of the bowels. It is ufed alfo externally, in aftringent and repellent lotions and collyria. Burnt alum taken internally has been highly extolled in cafes of colic. In fuch inftances, when taken to the extent of a fcruple for a dofe, it has been faid gently to move the belly, and give very great relief from the fevere pain.

Off. prep.—Alumen purif. *Lond.* Sulph. alum. exficc. *Ed. Lond. Dub.* Solutio fulphat. cupri. comp. *Ed.* Aqua alum. comp. *Lond.* Pulv. comp. *Ed.* Cataplafma, *Lond. Dub.*

SULPHAS BARYTÆ. *Ed.* *Terra ponderofa vitriolata, Barytes.*

Sulphate of baryta. Ponderous fpar.

THIS falt is found in great abundance in many countries, ei-

ther in a loofe earthy form, or compact, or foliated, or ftriated, or acicular. The foliated is in general the pureft. Its fpecific gravity is from 4.4 to 4.865. It is infoluble in water. It is foluble in boiling concentrated fulphuric acid. It decrepitates when fuddenly heated. By being formed into a thin cake with flour and water, and being afterwards heated to rednefs, it becomes phofphorefcent. Heated to rednefs with charcoal, it is converted into a fulphuret, and it may be decompofed either by boiling, or in a crucible, with the carbonates of potafs and of foda. It contains about 84 of baryta, and 16 fulphuric acid and water.

Off. prep.—Murias barytæ, *Ed.*

SULPHAS MAGNESIÆ. *Ed.* *Magnefia Vitriolata. Lond. Dub.* *Sal catharticus amarus.*

Sulphate of magnefia. Epfom falt.

THIS falt is contained in feveral mineral fprings, and alfo in fea water, from which it is obtained by evaporation. It cryftallizes in tetrahedral prifms. It has a very bitter tafte. It is foluble in its own weight of water at 60°, and three fourths of its weight of boiling water. Sulphate of magnefia, when perfectly pure, effloresces, but that of commerce generally contains foreign falts, fuch as the muriate of magnefia, which renders it fo deliquefcent that it muft be kept in a clofe veffel or bladder. By the action of heat it undergoes the watery fufion, and lofes its water of cryftallization, but does not part with its acid. It is decompofed by baryta, ftrontia, the alkalies, and all the falts formed by thefe falifiable bafes, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate, of lime.

Medical ufe.—It is a mild and gentle purgative, operating with fufficient efficacy, and in general with eafe and fafety, rarely occafioning any gripes, ficknefs, or the other inconveniencies which refinous purgatives too often occafion. Six or eight drachms may be diffolved for a dofe in a proper quantity of common water; or four, five, or more, in a pint, or quart of the purging mineral waters. Thefe folutions may likewife be fo managed as to promote evacuation by the other emunctories: if the patient be kept warm, they increafe perfpiration: and by moderate exercife in the cool air, the urinary difcharge. Some allege this falt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

It is, however, principally ufed for the preparation of the carbonate of magnefia.

Off. prep.—Carbonas magnefiæ, *Ed.*

SULPHUR SUBLIMATUM. *Lond. Dub. Ed.* *Sulphuris flores.*

Sublimed ſulphur.

THE properties of ſulphur have been already mentioned.

In the neighbourhood of volcanoes it is ſometimes found perfectly pure and cryſtallized; but all the ſulphur of commerce is extracted from pyrites by ſublimation. It is uſually brought to us in large irregular maſſes, which are afterwards melted and caſt into cylindrical rolls, with the addition of ſome coarſe reſin, flour, or the like; whence the paler colour of the rolls.

Sulphur ſhould be choſen of a bright yellow colour, ſhould be very inflammable, and ſhould burn with a bright pure blue flame. Sublimed ſulphur is never prepared by the apothecary. It has the form of a very fine powder, having a beautiful yellow colour. It is often contaminated with a little ſulphuric acid, formed during the proceſs, from which it is eaſily freed by waſhing.

Medical uſe.—Sulphur ſtimulates the ſyſtem, looſens the belly, and promotes the inſenſible perſpiration: it ſeems to pervade the whole habit, and manifeſtly tranſpires through the pores of the ſkin, as appears from the ſulphureous ſmell of perſons who have taken it, and from ſilver being ſtained in their pockets of a blackiſh colour. In the ſtomach it is probably combined with hydrogen. It is a celebrated remedy againſt cutaneous diſeaſes, particularly pſora, both given internally, and externally applied. It has likewiſe been recommended in rheumatic pains, flying gout, rickets, atrophy, coughs, aſthmas, and other diſorders of the breaſts and lungs; and particularly in catarrhs of the chronic kind. In hæmorrhoidal affections it is almoſt ſpecific; but in moſt of theſe caſes it is advantageouſly combined with ſome cooling purgative, eſpecially ſuper-tartrite of potaſs.

Off. prep.—Sulph. ſub. lot. *Ed. Lond. Dub.* Sulphas pot. cum ſulph. *Ed.* Sulphur. pot. *Ed. Lond. Dub.* Hydro-ſulph. ammon. *Ed.* Sulph. hydrarg. nigr. *Ed. Lond. Dub.* Hydrarg. ſulph. rub. *Lond. Dub.* Oleum ſulph. *Ed. Lond.* Petrol. ſulph. *Lond.* Ungt. ſulph. *Ed. Lond. Dub.*

SUPER-TARTRIS POTASSÆ. *Ed. Tartari Cryſtalli. Lond. Tartari cryſtalli et cremor dictum. Dub. Tartarus purificatus.*

Super-tartrate of potaſs, cryſtals of tartar, and cream of tartar.

SUPER-TARTRIS POTASSÆ IMPURUS, *Ed. Tartarum. Lond. Dub. Tartarus crudus.*

Impure ſuper-tartrate of potaſs. Tartar.

TARTAR exiſts in verjuice and in muſt, and is depoſited on the ſides of the caſks by repoſe, from which it is ſcraped ſome time before the next vintage, to prepare the caſks to receive the new wine. The deepeſt coloured and coarſeſt wines generally give

most tartar ; and it gets the name of white or red tartar according to its colour.

It is purified by dissolving it in boiling water, and separating the earthy part by filtrating the boiling solution. On cooling the solution, it deposites irregular crystals, containing the oily and colouring matters, which are separated by boiling the mass with a white clay. At Venice, it is purified by dissolving it in water, and clarifying it with whites of eggs and ashes. The tartar, thus purified, when crystallized, or in powder, is called Cream of Tartar.

Its crystals are small and irregular, and do not melt in the mouth, but feel gritty under the teeth. It has an acid harsh taste. It is soluble in sixty times its weight of water at 60°, and in thirty at 212°. It is decomposed, and its acid is destroyed, by heat. It contains 23 parts of potass, according to Bergmann, and 33, according to Thenard.

Medical use.—The virtues of tartar are those of a mild, cooling, aperient, laxative, medicine. It is much used in dropsy ; and some allege that it has good effects as a deobstruent, in dropsy from scirrhus. Taken from half an ounce to an ounce, it proves a gentle, though effectual, purgative. Given in smaller doses, and in solution, it often acts as a powerful diuretic.

Off. prep.—Tartris potassæ, *Ed. Lond. Dub.* Tartris pot. et sodæ, *Ed. Lond. Dub.* Tartris ant. *Ed. Lond Dub.* Ferrum tartarisat, *Lond.* Inf. sennæ tartar. *Lond.* Pulv. jalap. comp. *Ed.* Pulv. scam. comp. *Ed.* Pulv. sennæ comp. *Ed.*

SUS SCROFA. *Ed.* *Sus. Lond. Dub.*

Cl. *Mammalia.*—Ord. *Pachyderma.*

The hog.

Off.—Adeps, vulgo Axungia porcina. The fat. Hogs lard.

HOGS-LARD is a very pure animal fat, of a soft consistence. Hence it is emollient, and is a convenient article for the formation of ointments, plasters, and liniments.

Off. prep.—Adeps ppt. *Lond.* Ungt. adipis suill. *Lond.* Ungt. resin. *Ed.* Empl. canth. *Lond. Dub.* Ungt. hell. alb. *Dub.* Ungt. sulph. *Ed.* Ungt. acidi nitrosi, *Ed* Ungt. hydrarg. *Ed. Lond. Dub.* Ungt. oxidi hydrarg. rubri, *Ed.* Ungt. nitrat. hydrarg. *Ed. Lond. Dub.* Ungt. infus. mel. vesic. *Ed.*

SWIETENIA.

Willd. g. 843. *Decandria Monogynia.*—Nat. ord *Trihilatæ.*

Sp. 1. SWIETENIA MAHAGONI. *Ed.*

Mahogany tree.

Off.—Cortex. The bark.

This majestic tree grows principally in Jamaica and in Spanish America. Its useful wood is universally known. Its bark is brown, rough, and scaly; on the branches grey and smoother. Its taste is very astringent, and bitterer than that of Peruvian bark. Its smell weak and aromatic. In its properties and action on the living body, it coincides nearly with Peruvian bark, and may be substituted for it in many situations.

Sp. 2. Swietenia Febrifuga. *Ed.*

Febrifuge Swietenia.

Off.—Cortex. The bark.

This species, which in many respects resembles the former, is a native of the East Indies. Its bark is red, brittle, and compact, and covered with a rough grey cuticle. In its properties it agrees with the mahogany bark, and forms a very valuable substitute for Peruvian bark in the East Indies, where this last is so dear and scarce, and the diseases in which it is indicated so common. It is, however, merely an astringent bitter, and contains no cinchonin. Dr. Roxburgh sent from India a quantity of the extract of this bark, which could not be distinguished from the kino of the shops.

TAMARINDUS INDICA. *Ed.* *Tamarindus. Lond. Dub.* *Willd. g.* 1250, *sp.* 1. *Monadelphia Triandria.*—Nat. ord. *Lomentaceæ.*

Tamarind tree.

Off.—Fructus conditus. The preserved fruit.

This tree grows both in the East and West Indies. The fruit is a broad ash-coloured pod. The external covering is thin and brittle, and contains several hard seeds, enveloped in a soft brown pulp. Tamarinds are cured in two ways. The common way is to throw hot sugar from the boilers on the ripe pulp; but a better method is to put alternate layers of tamarinds and powdered sugar in a stone jar. By this means the tamarinds preserve their colour, and taste more agreeably.

East-India tamarinds are longer than the West-India sort; the former containing six or seven seeds each, the latter rarely above three or four.

Preserved tamarinds should be fresh and juicy, and should have an agreeable acid taste. They should not have a musty smell; the seeds should not be soft and swollen, and the blade of a knife should not get a coating of copper by being immersed amongst them.

Tamarinds contain sugar, mucilage, citric acid, super-tartrite of potass, tartarous acid, and malic acid.

Medical uſe.—The pulp of theſe fruits, taken in the quantity of from two or three drachms to an ounce or more, proves gently laxative and purgative; and at the ſame time, by its acidity, quenches thirſt, and allays immoderate heat. It increaſes the action of the purgative ſweets, caſſia and manna, and weakens that of the reſinous cathartics.

Salts, whoſe baſe is potaſs, form an improper addition to tamarinds, for they are decompoſed, and the tartarous acid of the fruit is precipitated in the form of ſuper-tartrate of potaſs.

Off. prep.—Inf. cum ſenna, *Ed.* Elect. caſſiæ, *Ed. Lond. Dub.* Elect. ſennæ, *Ed. Lond.*

TANACETUM VULGARE. *Ed.* *Tanacetum. Folia. Dub. Lond.*

Willd. g. 1472, *ſp.* 18. *Syngeneſia ſuperflua.*—Nat. ord. *Compoſitæ diſcoideæ.*

Tanſy.

Off.—Folium, Flos. The flower and leaves.

TANSY is perennial, and grows wild by road-ſides and the borders of fields, and is frequently alſo cultivated in gardens, both for culinary and medicinal uſes: it flowers in June and July.

Medical uſe.—Conſidered as a medicine, it is a moderately warm bitter, accompanied with a ſtrong, not very diſagreeable flavour. Some phyſicians have had a great opinion of it in hyſteric diſorders, particularly thoſe proceeding from a deficiency or ſuppreſſion of the uterine purgations. The leaves and ſeeds have been of conſiderable eſteem as anthelmintics; the ſeeds are leſs bitter, and more acrid and aromatic than thoſe of rue, to which they are reckoned ſimilar; or of ſantonicum, for which they have been frequently ſubſtituted. An infuſion of tanſy, drunk in a manner ſimilar to tea, has been ſtrongly recommended as a preventive of the return of gout.

TEUCRIUM.

Willd. g. 1093. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Sp. 12. TEUCRIUM MARUM. *Marum Syriacum. Lond. Dub.*

Syrian herb maſtich.

Off.—Herba. The herb.

THIS is a ſmall ſhrubby plant, growing ſpontaneouſly in Syria, Candy, and other warm climates, and cultivated with us in gardens. The leaves have an aromatic bitteriſh taſte; and, when rubbed betwixt the fingers, a quick pungent ſmell, like volatile alkali, which ſoon affects the head, and occaſions ſneezing: diſ-

tilled with water, they yield a very acrid, penetrating eſſential oil, reſembling that of ſcurvy-graſs. Theſe qualities ſufficiently point out the uſes to which this plant might be applied: at preſent it is little otherwiſe employed than in cephalic ſnuffs.

Off. prep.—Pulv. aſari comp. *Ed. Lond. Dub.*

Sp. 34. TEUCRIUM SCORDIUM. *Scordium. Lond.*

Water germander.

Off.—Herba. The herb.

THIS is a ſmall, ſomewhat hairy, perennial plant, growing wild in ſome parts of England, though not very common: the ſhops are generally ſupplied from gardens. It has a bitter taſte, and a ſtrong diſagreeable ſmell.

Off. prep.—Catap. cumini, *Lond.*

TOLUIFERA BALSAMUM. *Ed. Balſamum Tolutanum. Lond. Dub.*

Willd. g. 828, *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Balſam of Tolu.

Off.—Balſamum. The balſam.

THIS tree grows in Spaniſh America, and the balſam flows from inciſions made in its bark, during the hot ſeaſon, and is brought to us in little gourd ſhells. It is of a yellowiſh-brown colour, inclining to red: in conſiſtence thick and tenacious: by age it grows hard and brittle, without ſuffering any great loſs of its more valuable parts. The ſmell of this balſam is extremely fragrant, ſomewhat reſembling that of lemons; its taſte warm and ſweetiſh. Lewis ſays that he has ſometimes procured benzoic acid from it. It yields very little volatile oil, although it impregnates the diſtilled water ſtrongly with its flavour. By diſſolving a proper quantity of ſugar in this water, a ſyrup is obtained, greatly ſuperior to that prepared in the common way, with a decoction of the balſam.

In its medical virtues it agrees with the other balſams.

Off. prep.—Syr. *Lond.* Tinct. *Ed. Lond. Dub.* Tinct. benz. comp. *Lond. Ed.*

TORMENTILLA ERECTA. *Ed. Tormentilla. Lond. Dub.*

Willd. g. 1001, *ſp.* 1. *Icoſandria Polygynia.*—Nat. ord. *Senticoſæ.*

Septfoil.

Off.—Radix. The root.

TORMENTIL is perennial, and found wild in woods and on commons: it has long ſlender ſtalks, with uſually ſeven long narrow leaves at a joint; the root is for the moſt part crooked and

knotty, of a blackiſh colour on the outſide, and a reddiſh within. This root has an auſtere ſtyptic taſte, accompanied with a ſlight kind of aromatic flavour; it is one of the moſt agreeable and efficacious of the vegetable aſtringents, and is employed with good effect in all caſes where medicines of this claſs are proper. Neumann got from 960 grains, 365 alcoholic, and 170 watery extract; and inverſely, 570 watery and 8 alcoholic.

Off. prep.—Pulv. cret. comp.

TRIGONELLA FOENUM GRÆCUM. *Foenum Græcum. Lond.*

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Fenugreek.

Off.—Semen. The ſeeds.

THIS plant is annual, and a native of the ſouth of France. In Poland it is cultivated in large quantities. The ſeeds have a yellowiſh colour, a rhomboidal figure, a diſagreeable ſtrong ſmell, and a mucilaginous taſte. Their principal uſe was in cataplaſms, fomentations, and the like, and in emollient glyſters. Neumann got from 7680 parts, 620 bitter watery, and 30 unctuous alcoholic extract; and inverſely, 270 very ungrateful alcoholic, and 390 watery. The diſtilled water had a ſlight ſmell of fenugreek, which it ſoon loſt.

TRITICUM.

Willd. g. 152. *Triandria Monogynia.*—Nat. ord. *Gramina.*

Sp. 1. TRITICUM ÆSTIVUM. *Dub.*

Sp. 2. TRITICUM HYBERNUM. *Lond.*

Wheat.

Off.—Farina, amylum. Flour, ſtarch.

BY ſome theſe are conſidered only as varieties of wheat, not as diſtinct ſpecies. The latter, however, is the moſt productive, and is moſt commonly cultivated on that account; for there is no material difference between the grains they produce, which are indiſcriminately employed for every purpoſe.

Wheat-flour conſiſts principally of gluten, ſtarch, albumen, and a ſweet mucilage. Theſe may be ſeparated by forming the flour into a paſte with a little water, and waſhing this paſte with freſh quantities of water, until it runs from it colourleſs. What remains is the gluten; which, if not the ſame, is very analogous to the fibrine of animal ſubſtances. From the water with which the paſte was waſhed, a white powder, *Amylum*, ſeparates on ſtanding. The albumen and ſweet mucilage remain diſſolved in the water. By evaporating it, the albumen firſt ſeparates in

white flakes, and the ſweet mucilage may be got by total evaporation.

It is the preſence of gluten which characterizes wheat flour; and on the due admixture of it with the other conſtituents depends the ſuperiority of wheat flour for baking bread.

Bread is made by working the flour into a paſte with water, a quantity of ſome ferment, ſuch as yeaſt, and a little muriate of ſoda to render it ſapid, allowing the paſte to ſtand until a certain degree of fermentation take place, and then baking it in an oven heated to about 488°. During the fermentation a quantity of gas is formed, and as it is prevented from eſcaping by the toughneſs of the paſte, and dilated by the heat of the oven, the bread is rendered light and ſpongy. In this proceſs the nature of the conſtituents of the flour is altered, for we are not able to obtain either gluten or ſtarch from bread.

Medical uſe.—Bread is not only one of the moſt important articles of nouriſhment, but is alſo employed in pharmacy for making cataplaſms, and giving form to more active articles. An infuſion of toaſted bread has a deep colour and pleaſant taſte, and is an excellent drink in febrile diſeaſes, and debility of the ſtomach.

AMYLUM EX TRITICO PREPARATUM.
Wheat ſtarch.

THE Edinburgh college have inſerted ſtarch as a ſeparate ſubſtance in their catalogue of the materia medica, probably conſidering it to be a general principle common to many vegetables, although they point out the particular ſpecies which they wiſh to be employed.

The general properties of ſtarch have been already enumerated. It is found in many vegetables, combined with different ſubſtances. Fourcroy, accordingly, makes various ſpecies of it; as, combined,

1. With gluten or fibrine; as in wheat, rye, and other ſimilar ſeeds.
2. With extractive; as in beans, peas, lupins, &c.
3. With mucilaginous matters; as in the potatoe, and many other roots, in unripe corn.
4. With ſaccharine matter; in moſt roots, and in corn after it has begun to germinate.
5. With oil; in the emulſive ſeeds, almonds, &c.
6. With an acrid principle; as in the root of the burdock, jatropha manihot, arum, aſarum, and other tuberous roots.

Medical uſe.—As a conſtituent of many vegetable ſubſtances, it forms a moſt important alimentary ſubſtance. In a medical point of view, it is to be conſidered as a demulcent; and accordingly, it forms the principal ingredient of an officinal lozenge, and a mucilage prepared from it often produces excellent effects, both taken by the mouth, and in the form of a clyſter in dyſentery and diarrhœa, from irritation of the inteſtines.

Off. prep.—Mucilago amyli, *Ed. Lond.* Trochiſci gummoſi, *Ed. Lond.* Pulv. trag. comp. *Lond.* Pil. hydrarg. *Ed.*

TUSSILAGO FARFARA. *Ed.* *Tuſſilago. Lond. Dub.*

Willd. g. 1483, *ſp.* 12. *Syngeneſia ſuperflua.*—Nat. ord. *Compoſitæ radiatæ.*

Colts foot.

Off.—Folium, flos. The herb and flowers.

THIS grows wild in moiſt ſituations, producing yellow flowers in February and March: theſe ſoon fall off, and are ſucceeded by large roundiſh leaves, hairy underneath; their taſte is herbaceous, ſomewhat glutinous and ſubacrid.

Med. uſe.—Colts foot is recommended in coughs, phthiſis, and other diſorders of the breaſt and lungs, and ſome uſe it in ſcrofula. Its effects probably depend more on the milk in which it is commonly directed to be taken, than on the tuſſilago itſelf.

ULMUS CAMPESTRIS. *Ed.* *Ulmus. Lond. Dub.*

Willd. g. 505, *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Scabridæ.*

Elm tree.

Off.—Cortex interior. The inner bark.

THIS tree grows wild in Britain. The inner bark has a yellowiſh colour, and a mucilaginous, bitter, aſtringent taſte, without ſmell.

In decoction it has been highly recommended in the lepra ichthyoſis, and has been ſaid to cure dropſies, but it requires a patient trial.

Off. prep.—Decoct. *Lond.*

URTICA DIOICA. *Urtica. Lond.*

Monoecia Tetrandria.—Nat. ord. *Scabridæ.*

Common nettle.

Off.—Herba. The plant.

THIS is a well known perennial weed. The leaves of the freſh plant ſtimulate, inflame, and bliſter the ſkin. Hence ſtinging with nettles has been recommended as a powerful rubefacient, and has been alleged to have ſometimes ſucceeded in reſtoring ſenſe and motion to paralytic limbs, and in caſes of torpor.

VALERIANA OFFICINALIS. *Ed.* *Valeriana ſylveſtris. Lond. Dub.*

Willd. g. 75, *ſp.* 6. *Triandria Monogynia.*—Nat. ord. *Aggregatæ.*

Wild valerian.

Off.—Radix. The root.

THIS plant is perennial, and grows wild in Britain. Like many other plants, it varies in its appearance and ſenſible qualities, according to the ſituation in which it grows. In marſhes and ſhadowy places its leaves are broader, on dry heaths and high paſtures they are narrower.

The roots produced in low watery grounds have a remarkably faint ſmell in compariſon of the others, and ſometimes ſcarcely any. The roots taken up in autumn or winter, have alſo much ſtronger ſenſible qualities than thoſe collected in ſpring and ſummer.

The root conſiſts of a number of ſtrings or fibres matted together, iſſuing from one common head, of a whitiſh, or pale browniſh colour. Its ſmell is ſtrong, like a mixture of aromatics with fetids; the taſte unpleaſantly warm, bitteriſh, and ſubacrid. Neumann got from 480 grains of the dry root 186 alcoholic, and 74 watery extract; and inverſely, 261 watery and 5 alcoholic. The diſtilled alcoholic was ſlightly, the water ſtrongly, impregnated with the ſmell of the valerian, but no ſeparable oil was obtained.

Med. uſe.—Wild valerian is a medicine of great uſe in nervous diſorders; and is particularly ſerviceable in epilepſies proceeding from a debility of the nervous ſyſtem.

Some recommend it as uſeful in procuring ſleep, particularly in fever, even when opium fails; but it is principally uſeful in affections of the hyſterical kind.

The common doſe is from a ſcruple to a drachm in powder; and in infuſion, from one to two drachms. Its unpleaſant flavour is moſt effectually concealed by a ſuitable addition of mace.

As its virtues reſide entirely in an eſſential oil, the decoction and watery extract are improper forms for exhibiting it.

Off. prep.—Tinct. *Lond.* Tinct. ammon. *Lond. Dub.* Extract. *Dub.*

VERATRUM ALBUM. *Ed.* *Helleborus albus. Lond. Dub.*

Polygamia Monoecia.—Nat. ord. *Liliaceæ.*

White hellebore.

Off.—Radix. The root.

THIS plant grows ſpontaneouſly in Switzerland and the mountainous parts of Germany. The root has a nauſeous, bitteriſh, acrid taſte, burning the mouth and fauces. If wounded when

fresh, it emits an extremely acrimonious juice, which, when inserted into a wound, is said to prove very dangerous. Neumann got from 960 grains 560 watery and 10 alcoholic extract; and inversely, 420 alcoholic and 180 watery. Nothing rose in distillation.

Med. use.—The powder of the dried root, applied to an issue, occasions violent purging; snuffed up the nose, it proves a strong, and not always a safe, sternutatory. Taken internally, it acts with extreme violence as an emetic; and has been observed, even in a small dose, to occasion convulsions, and even death. The ancients sometimes employed it in very obstinate cases, and always made this their last resource. Modern practice seems to have almost entirely rejected its internal use, though some have ventured upon so large a dose as a scruple, in maniacal cases, and are said to have experienced good effects from it.

Off. prep.—Decoct. *Lond.* Tinct. *Ed.* Ungt. *Lond. Dub.*

VERONICA BECCABUNGA. *Beccabunga. Lond. Dub.* *Willd. g.* 44, *sp.* 30. *Diandria Monogynia.*—Nat. ord. *Personatæ.*

Brooklime.

Off.—Herba. The herb.

This is a low perennial plant, common in little rivulets and ditches of standing water. The leaves remain all the winter, but are in greatest perfection in the spring. Their prevailing taste is an herbaceous one, accompanied with a very light bitterness.

If any good effects be expected from brooklime, it should be used as food.

Off. prep.—Succus coch. comp. *Lond.*

VIOLA ODORATA. *Ed.* *Viola. Lond. Dub.* *Willd. g.* 446, *sp.* 12. *Pentandria Monogynia.*—Nat. ord. *Campanaceæ.*

March violet.

Off.—Flos. The recent flower.

This plant is perennial, and is found wild under hedges and in shady places; but the shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour and their peculiar richness of colour, that they have given a name to both.

In our markets we meet with the flowers of other species: these may be distinguished from the foregoing by their being larger, of a pale colour, and having no smell.

Med. use.—They impart their colour and flavour to aqueous liquors: a syrup made from the infusion has long maintained a

place in the ſhops, and is ſaid to be an agreeable and uſeful laxative for children; but is chiefly valued as a delicate teſt of the preſence of uncombined acids or alkalies, the former changing its blue to a red, and the latter to a green colour.

Off. prep.—Syr. violæ odorat. *Ed. Lond. Dub.*

VITIS VINIFERA. *Ed.* *Vitis. Lond. Dub.*

Willd. g. 453, *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Hederaceæ.*

The vine.

The vine grows in temperate ſituations in many parts of the world, and is cultivated very generally for the ſake of its agreeable ſubacid fruit. Before they are ripe, grapes are extremely harſh and acid, and by expreſſion furniſh a liquor which is called Verjuice. It contains malic acid, ſuper-tartrate of potaſs, and extractive, and may be made to furniſh wine by the addition of ſugar. As the grape advances to maturity, the quantity of ſugar increaſes, while that of malic acid diminiſhes: it however never diſappears entirely. When thoroughly ripe, the grape is one of the moſt agreeable fruits. It is cooling, antiſeptic, and nutritious, and, when eaten in conſiderable quantity, diuretic, and gently laxative. In inflammatory diſeaſes, and all others where acids are indicated, they form an excellent article of diet.

Fructus Siccatus. *Uva paſſa.*

Raiſins.

Raisins, are grapes which have been carefully dried. By this means not only the water they contained is diſſipated, but the quantity of acid ſeems to be diminiſhed. They become more ſaccharine, mucilaginous, and laxative, than the recent grape, but are leſs cooling.

Off. prep.—Decoct. alth. off. *Ed.* Decoct. guiac. comp. *Ed.* Decoct. hord. comp. *Lond.* Tinct. card. comp. *Lond. Dub.* Tinct. ſennæ, *Lond. Dub.*

Fructus Succus Fermentatus. Vinum album Hiſpanum, Vinum album Rhenanum, Vinum rubrum Luſitanicum.

Sherry, Hock, Port.

Wine is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of ſugar contained in the muſt, and the manner of its fermentation. When the proportion of ſugar is ſufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of ſugar be too large, part of it remains undecompoſed, as the

fermentation is languid, and the wine is ſweet and luſcious; if, on the contrary, it be too ſmall, the wine is thin and weak; and if it be bottled before the fermentation be completed, it will proceed ſlowly in the bottle, and on drawing the cork the wine will froth and ſparkle in the glaſs, as for example, Champaigne. When the muſt is ſeparated from the huſk of the grape before it is fermented, the wine has little or no colour: theſe are called White wines. If, on the contrary, the huſks are allowed to remain in the muſt while the fermentation is going on, the alcohol diſſolves the colouring matter of the huſks, and the wine is coloured, ſuch are called Red wines. Beſides in theſe principal circumſtances, wines vary very much in flavour. The red wines moſt commonly drunk in this country are Port, which is ſtrong and auſtere, containing much tannin, and Claret, which is thinner and higher flavoured. Our white wines are all ſtrong, Madeira, Sherry, Liſbon, Malaga, and Hock. Of theſe the laſt is the moſt acidulous, and Malaga the ſweeteſt.

Med. uſe.—Wine, taken in moderate quantities, acts as a beneficial ſtimulus to the whole ſyſtem. It promotes digeſtion, increaſes the action of the heart and arteries, raiſes the heat of the body, and exhilerates the ſpirits. Taken to exceſs, it produces inebriety, which is often ſucceeded by headach, ſtupor, nauſea, and diarrhœa, which laſt for ſeveral days. Habitual exceſs in wine debilitates the ſtomach, produces inflammation of the liver, weakens the nervous ſyſtem, and gives riſe to dropſy, gout, apoplexy, tremors, and cutaneous affections.

To convaleſcents, and in all diſeaſes of general debility, and deficiency of the vital powers, wine is the remedy on which we muſt place our chief dependance; and when properly adminiſtered, its effects are often ſcarcely credible.

The uſe of wine as an article of pharmacy, will be noticed hereafter.

WINTERA AROMATICA. *Ed.*

Willd. g. 1063. *Polyandria Tetragynia.*—Nat. ord. *Oleraceæ.*

Winters bark.

Off.—Cortex, vulgo Winteranus cortex.

THIS is the produce of a tree growing about the ſouthern promontory of America. It was firſt diſcovered on the coaſt of Magellan by Captain Winter, in the year 1567. The ſailors then employed the bark as a ſpice, and afterwards found it ſerviceable in the ſcurvy; for which purpoſe it is at preſent alſo ſometimes made uſe of in diet drinks. The true Winters bark is not often met with in the ſhops, Canella alba being generally ſubſtituted for it, and by ſome they are reckoned to be the ſame; there is, how-

ever, a confiderable difference betwixt them in appearance, and a greater in quality. The Winters bark is in large pieces, of a more cinnamon colour than the canella, and taftes much warmer and more pungent. Its fmell refembles that of cafcarilla. Its virtues refide in a very hot, ftimulant, volatile oil.

ZINCUM. *Ed. Dub. Lond.*
Zinc.

THE general properties of zinc have been already noticed. It is always found oxidized,

1. Combined with a greater or lefs proportion of carbonic acid. Calamine.
2. Combined with fulphur. Blende.
3. Combined with fulphuric acid, generally in folution.

The ores of zinc are rarely worked by themfelves, or with the fole intention of extracting zinc, but are generally melted with the lead ores, particularly galena, which they commonly accompany. By this procefs the zinc is obtained in two forms; part of it is fublimed in the ftate of an oxide, and attaches itfelf to the chimney of the furnace, in the form of a grey, granular, earthy-like, incruftation, which is known by the name of tutty or cadmia; part of it is fublimed in its metallic form, and is condenfed in the throat of the chimney in fmall grains, which are afterwards melted in a crucible, and caft in ingots.

Off. prep.—Oxidum zinci, *Ed. Lond. Dub.* Sulphas zinci, *Ed. Lond. Dub.*

OXIDUM ZINCI IMPURUM. *Ed.* *Tutia. Lond. Dub.*
Impure oxide of zinc. Tutty.

IT is moderately hard and ponderous; of a brownifh colour, and full of fmall protuberances on the outfide, fmooth and yellowifh within; fome pieces have a bluifh caft, from minute globules of zinc in its metallic form. Tutty is celebrated as an ophthalmic, and frequently employed as fuch in unguents and collyria.

Off. prep.—Oxidum zinci imp. ppt. *Ed. Lond.* Ungt. *Ed. Lond. Dub.*

CARBONAS ZINCI IMPURUS. *Ed.* *Lapis Calaminaris. Dub. Lond.*
Impure carbonate of zinc. Calamine.

THIS mineral is found plentifully in England, Germany, and other countries, either in diftinct mines, or intermingled with the

ores of different metals. It is usually of a greyish, brownish, yellowish, or pale reddish colour, without lustre or transparency; fracture commonly uneven or earthy; considerably hard, though not sufficiently so as to strike fire with steel. Before the blowpipe it decrepitates, but does not melt, and becomes yellower, and is sublimed. It is partly soluble in acids, and often effervesces with them.

Mr. Smithson has analysed several varieties of Calamine.

	Sp. Grav.	Ox. of Zinc.	Carb. Acid.	Water.	Quartz.
Derbyshire	4.333	65.2	34.8		
Somersetshire	4.336	64.8	35.2		
Carinthia	3.598	71.4	13.5	15.1	
Hungary	3.434	68.3		4.4	25.
Fribourg		38.		12.	50.

Calamine is generally roasted before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluxions of thin acrid humours upon the eyes, for drying up moist running ulcers, and healing excoriations.

Off. prep.—Cerat. *Ed. Lond. Dub.* Carb. zinci imp. ppt. *Ed. Lond. Dub.*

SULPHAS ZINCI. *Vitriolum album. Lond. Dub.*

Sulphate of zinc. White vitriol.

THIS is chiefly found native in the mines of Goslar, sometimes in transparent pieces, but more commonly in the form of white efflorescences, which are dissolved in water, and afterwards reduced by evaporation and crystallization into large masses. But as native sulphate of zinc is seldom pure, it is ordered to be prepared.

Med. use.—White vitriol is sometimes given, from five or six grains to half a drachm, as an emetic; it operates very quickly, and, if pure, without violence. Externally, it is employed as an ophthalmic, and is often made the basis of collyria, both in extemporaneous prescription and in dispensatories.

APPENDIX.

No. 1.

List of Substances contained in some of the latest and most esteemed Foreign Pharmacopœias, but not inserted in the Materia Medica of any of the British Colleges.

EXPLANATION OF THE ABBREVIATIONS.

Roff.—Pharmacopœia Roffica. 8vo. Petropoli, 1798.

Auft. prov.—Pharmacopœia Auftriaco-provincialis, emendata. 8vo. Viennæ, 1794.

Auft. caft.—Pharmacopœia Auftriaco-caftrenfis. 8vo. Ticini, 1795.

Brem.—Pharmacopœia in ufum officinarum reipublicæ Bremenfis confcripta. 8vo. Bremæ, 1792.

Bor.—Pharmacopœia Boruffica. 4to. Berolini, 1799.

Gen.—Formulario Farmaceutico per ufo dell' Ofpedale di Pammatone. 8vo. Geneva, 1800.

Mar.—Apparatus medicaminum nofocomiis, generatim curationi ægrotorum pauperum maxime accomodus Francifci Marabelli. 8vo. Bataviæ, anno Reipub. Gall. VIto. 1798.

Van M.—Pharmacopée manuelle, par J. B. Van Mons. 8vo. A Bruxelles, an. IX. 1801.

La G.—Manuel du Pharmacien par E. J. B. Bouillon La Grange. 8vo. A Paris, an. XI. 1803.

Parm.—Code Pharmaceutique, a l'ufage des hofpices civiles, des fecours a domiciles, et des prifons, publiè par ordre du Miniftre de l'interieur. Par A. A. Parmentier. 8vo. Paris, 1803.

ACHILLEA MILLEFOLIUM. *Millefolii herba, flores.* Roff. Auft. prov. Brem. Bor. La G.

Smell fomewhat aromatic; tafte flightly aftringent and bitterifh; effects ftomachic and tonic.

ACHILLEA NOBILIS. *Millefolii nobilis herba, flores.* Roff. Smell camphoraceous and aromatic, preferable in every refpect to the preceding fpecies.

ACHILLEA PTARMICA. *Ptarmicæ radix; herba cum floribus.* Roff.

No fmell; tafte acrid; effects fialogogue, fternutatory.

ADIANTUM CAPILLUS VENERIS. *Capillus veneris; herba.* Auft. prov. Van M. La G.

Ufed for preparing the fyrup called Capillaire.

AGARICUS MUSCARIUS. Roff.

Smell fetid; tafte acrid; effects inebriating, and inducing delirium.

AGRIMONIA EUPATORIA. *Agrimonia; herba.* Auft. prov. Brem. La G.

Slightly ftyptic and aftringent.

ALCEA ROSEA. *Malvæ arboreæ flores.* Roff. Brem. Bor. No fmell; tafte mucilaginous and fub-aftringent; effects emollient and fub-aftringent.

AMBRA AMBROSIACA GRYSEA. *Ambra gryfea.* Roff. Bor. Van. M.

Smell agreeable; tafte refinous and aromatic; effects exciting and augmenting the nervous power.

AMOMUM CURCUMA. Van M. *Curcumæ radix* Bor. Tafte bitterifh, aromatic.

AMOMUM GRANA PARADISI. *Grana paradifi.* Brem. La G.

Smell flightly aromatic; tafte acrid; effects ftimulating.

AMYGDALUS NANA. *Nuclei.* Roff.

No fmell; bitterifh tafte; a fubftitute for fweet almonds.

AMYGDALUS PERSICA. *Flores.* Van M. La G.
Aromatic; bitter; laxative.

ANAGALLIS ARVENSIS. *Anagallis. Herba.* Auſt. prov. Brem. Roſſ. Bor.
No ſmell; taſte at firſt herbaceous, afterwards bitter, and ſomewhat acrid.

ANEMONE PRATENSIS. *Pulſatillæ nigricantis herba.* Roſſ. Auſt. prov. Brem.
Smell ſlight; taſte acrid, cauſtic, durable; effects diuretic and ſtimulant.

ANEMONE NEMOROSA. *Ranunculi albi flores, et herba recens.* Roſſ.
Smell ſlight; taſte acrid; effects rubefacient and bliſtering.

ANTIRRHINUM LINARIA. *Linaria.* Auſt. prov. Brem. Bor.
Smell urinous; taſte bitteriſh; effects diuretic.

ARISTOLOCHIA CLEMATITIS. *Ariſtolochia vulgaris. Radix.* Roſſ.
Smell fragrant, but heavy; taſte bitter, durable; effects diuretic, emmenagogue.

ARISTOLOCHIA LONGA. *Radix.* La G.

ARISTOLOCHIA ROTUNDA. *Radix.* Brem. Bor. La G.
Smell, taſte, and effects ſimilar to thoſe of the preceding ſpecies.

ARISTOLOCHIA TRILOBATA. *Stipites; radix.* Roſſ.
Smell fragrant, ſtrong; taſte bitteriſh, correſponding with the ſmell; effect diaphoretic.

ARTEMISIA PONTICA. *Abſinthium ponticum; herba.* Auſt. prov.
Similar to A. abſinthium, but weaker.

ASCLEPIAS VINCETOXICUM. *Radix.* La G.
Stimulant cordial; diaphoretic.

ASPARAGUS SATIVA. *Radix.* La G.
Taſte bitter-ſweet; mucilaginous; aperitive, imparting its ſmell to the urine.

ASPLENIUM SCOLOPENDRIUM. *Folia.* Van M.
Sub-aſtringent.

ASTRAGALUS EXSCAPUS. *Radix.* Roſſ. Auſt. prov. Brem.
No ſmell; taſte bitteriſh and ſub-aſtringent; effects demulcent, and falſely ſuppoſed anti-ſyphilitic.

AURUM. La G.

BELLIS PERENNIS. *Flos.* *Folium.* Auſt. prov.
No ſmell; taſte ſlightly acrid.

BETONICA OFFICINALIS. *Folia.* La G.
Aperitive.

BETULA ALNUS. *Alni folia.* Roſſ.
No ſmell; taſte aſtringent and bitteriſh; effects diſcutient and vulnerary.

BISMUTHUM, vulgo MARCASITA. Bor.
A very brittle, fuſible, and volatile metal. When diſſolved in nitric acid, it is precipitated in the form of a white oxide by water.

BITUMEN ASPHALTUM. *Aſphaltum.* Bor.
A black friable bitumen, ſhining in its fracture.

BOLETUS LARICIS. *Agaricus albus.* *Agaricus chirurgorum.* Brem. Auſt. prov. Bor. Van M. La G.
Taſte nauſeous and bitter; effects emetic, cathartic, draſtic.

BOLETUS SALICIS. Bor.
An unequally porous fungus growing on the willow, and diffuſing an aromatic ſmell, eſpecially after rain.

BOLUS ALBA. Auſt. prov.

BOLUS ARMENA. Auſt. prov. Bor. Van M.
No ſmell; adheres to the tongue; effects exſiccative.

BORAGO OFFICINALIS. *Folia, flores.* Van M. La G.
Saline; aperitive.

BOS TAURUS. *Lac vaccinum.* Auſt. prov. Gen. Bor. Van M.
Nutritious; demulcent.

Serum lactis vaccini. Mar.
Attenuant; antiseptic.

Saccharum lactis. Bor.
Nutritious; demulcent.

Butyrum. Van M.
Unctuous.

Sevum Bovinum. Roff. Auft. caft.
Unctuous, emollient.

Fel tauri. Bor. Mar. Van M.
Stomachic.

BRASSICA (ERUCA). *Erucæ femina.* Roff. Bor.
Smell heavy; tafte acrid; effects ftimulant.

BRUNELLA VULGARIS. *Folia.* La G.
Vulnerary; aftringent.

BUBON MACEDONICUM. *Semina.* La G.
Acrid; aromatic.

BUGLOSSUM OFFICINALE. *Folia, flores.* La G.
Demulcent.

CALENDULA OFFICINALIS. *Calendula.* Auft. prov. Van M
Tafte bitterifh.

CANNABIS SATIVA. *Cannabis. Semina.* Roff. Brem. Bor. Van M.
Smell weak; tafte mawkifh; effects emollient, anodyne.

CARBO. Van M.
Antifeptic; difoxygenizing.

CARDUUS MARIANUS. *Carduus Mariæ. Semen.* Brem.
Emulfive.

CAREX ARENARIA. *Radix.* Roff. Bor.
Smell agreeable, but not ftrong; effects demulcent, refolvent.

CARLINA ACAULIS. *Carlinæ, feu Cardopathiæ Radix.* Bor. La G.
Tafte very acrid and bitter; fmell fomewhat aromatic, but naufeous.

CARTHAMUS TINCTORIUS. *Grana.* La G.
Cathartic.

CERATONIA SILIQUA. *Siliqua dulcis.* Roff. Auſt. prov. Brem. Bor.
No ſmell; taſte ſweet; effects edulcorant, expectorant.

CHELIDONIUM MAJUS. *Radix, herba recens.* Roff. Auſt. prov. Brem.
Smell heavy; taſte acrid, bitteriſh, durable; effects acrid, purgative; when dried, aperient, diuretic.

CHENOPODIUM AMBROSIOIDES. *Chenopodii herba.* Brem. Bor. Van M.
Smell ſtrong, fragrant; taſte acrid, aromatic; effects ſtimulant, carminative, anthelmintic.

CHENOPODIUM BOTRYS. *Botrys vulgaris. Herba.* Roff. Van M.
Qualities and effects ſimilar to, but ſtronger than, thoſe of the preceding ſpecies.

CICHORIUM INTYBUS. *Cichorii radix, herba.* Roff. Auſt. prov. *et* caſt. Brem. La G. Van M. Gen. Bor. Mar.
No ſmell; taſte of the herb agreeably bitter, of the root intenſely bitter; effects aperient, tonic, diuretic.

CICUTA VIROSA. *Herba.* Bor.
Smell heavy; narcotic.

CLEMATIS ERECTA. *Flammulæ Jovis folia, flores.* Roff. Auſt. prov. Bor. Van M.
Smell weak; taſte acrid, bliſtering; effects diuretic, ſudorific.

COLUBER VIPERA. La G.
Nutritious.

CONFERVA DICHOTOMA. *Fucus helminthocortos. Helminthocorton.* Roff. Brem. Gen. Bor. Mons.
Smell marine, fetid; taſte ſaline; effects purgative, anthelmintic.

CONVALLARIA MAJALIS. *Liliorum convallium flores.* Bor. Mons. La G.
Aromatic; cephalic.

CONVOLVULUS AMERICANUS. *Mechoacanha; radix.* Brem. La G.
Taſte at firſt ſweetiſh, then ſubacrid; effect purgative.

CONVOLVULUS TURPETHUM. *Radix.* Van M.
Cathartic.

CORDIA MYXA. *Fructus.* La G.
Pectoral.

CUCUMIS MELO. *Melo.* *Semen.* Auſt. prov. Bor.
Emulſive.

CUCURBITA PEPO. *Pepo.* *Semen.* Auſt. prov.
Emulſive.

CYCAS CIRCINALIS. *Sago grana.* Roff. Brem.
Amylaceous; nutritious.

CYNOGLOSSUM OFFICINALE. *Radix.* Van M. La G.
Aſtringent; inſpiſſant.

CYNOMORIUM COCCINEUM. *Fungus Melitenſis.* Roff.
No ſmell; taſte ſtyptic, bitteriſh, ſaline; effects roborant, aſtringent.

CYTINUS HYPOCISTIS. *Hypociſtis.* *Succus inſpiſſatus.* Auſt. prov.
Taſte acrid, auſtere; effect aſtringent.

DICTAMNUS ALBUS. *Radix.* Auſt. prov. Brem. Bor. La G.
Smell fragrant; taſte bitter, ſub-aromatic; effects tonic, anthelmintic.

DIGITALIS EPIGLOTTIS. *Folia.* Gen.
An Italian ſubſtitute for the D. propurea.

EPIDENDRUM VANILLA. *Vanillæ ſiliqua.* Roff. Van M. La G.
Smell fragrant, balſamic; taſte aromatic, ſub-acid, unctuous; effects heating, diuretic.

ERINGIUM CAMPESTRE. *Radix.* La G.
Aperitive; diuretic.

ERYSIMUM OFFICINALE. *Eryſimum.* *Herba.* Brem. La G.
Taſte acrid; effects aſtringent, diuretic.

EUPATORIUM CANNABINUM. *Folia.* Van M.
Smell acrid, penetrating; taſte intenſely bitter; diuretic; emetic; cathartic.

EUPHORBIA OFFICINALIS. *Euphorbii gummi.* Roſſ. Auſt. prov. Bor. Van M.
No ſmell; taſte at firſt none, then pungent, burning; effects acrid, draſtic.

EUPHRASIA OFFICINALIS. *Herba.* Van M. La G.
Ophthalmic.

FAGARA OCTANDRA. *Tacamahaca. Gummi-reſina.* Roſſ. Bor.
Smell fragrant like lavender; taſte bitteriſh, nauſeous; effects tonic, ſtimulant.

FICUS INDICA RELIGIOSA. *Laccæ gummi.* Roſſ. Brem. Bor.
Reſinous.

FORMICA RUFA. *Formicæ cum acervo.* Roſſ. Brem. Bor.
Qualities and effects depend on the little acetous acid they contain.

FRAGARIA VESCA. *Radix.* Van. M.
Refrigerant; diuretic.

GADUS LOTA. *Muſtela fluviatilis. Liquamen hepatis.* Auſt. prov.
Detergent; ſolvent.

GENTIANA PANNONICA. *Gentiana. Radix.* Auſt. prov. *et* caſt.
Qualities and effects the ſame as thoſe of the gentiana lutea.

GEUM RIVALE. *Gei paluſtris radix.* Roſſ.
Smell weak; taſte ſtyptic, auſtere; effects tonic, aſtringent, febrifuge.

GEUM URBANUM. *Caryophyllatæ radix.* Roſſ. Auſt. prov. Brem. Bor. La G.
Smell caryophyllaceous, loſt by drying; taſte ſtyptic, bitter; effects tonic, aſtringent, febrifuge; ſaid to be an excellent ſubſtitute for Peruvian bark.

GLECOMA HEDERACEA. *Hedera terreſtris. Herba.* Auſt. prov. Brem. Bor. Van M. La G.
Taſte bitteriſh, ſub-acrid; effects expectorant, roborant.

GLYCYRRHIZA ECHINATA. *Liquiritia, radix.* Bor.
A Ruſſian ſubſtitute for the G. glabra.

GUILANDINA MORINGA. *Nuces Behen.* Bor.
Oily.

HEDERA HELIX. *Gummi-resina.* La G.
Agglutinant.

HIRUDO MEDICINALIS. *Hirudo. Animal vivum.* Aust. cast. Gen. Bor. Mar.
Topical abstraction of blood.

HUMULUS LUPULUS. *Lupuli strobuli.* Bor. La G.
Agreeably bitter; anodyne, diuretic, resolvent.

HYPERICUM QUADRANGULARE. *Hypericum. Flores.* Brem.
Smell agreeable; taste bitterish, sub-astringent; balsamic; effects vulnerary.

ILEX AQUIFOLIUM. *Aquifolii folia.* Ross. Bor.
No smell; taste astringent; effects febrifuge, antiarthritic.

ILLICIUM ANISATUM. *Anisum stellatum. Fructus.* Aust. prov. Brem. Ross. Bor. Van M. La G.
Smell aromatic, taste agreeable, like anise; effects pectoral, carminative, diuretic.

IMPERATORIA OSTRUTHIUM. *Imperatoriæ radix.* Ross. Aust. prov.
Smell aromatic; taste warm, pungent, very durable; effects stimulant, carminative, sudorific, diuretic.

JASMINUM OFFICINALE. *Jasmini flores.* Ross. Brem.
Smell fragrant; taste bitterish; used as a perfume.

LACTUCA SATIVA. *Folia.* La G.
Refreshing; anodyne.

LAMIUM ALBUM. *Flores.* Van M. La G.
Astringent; tonic.

LAURUS PECHURIM. *Faba.* Van M.
Bitter, aromatic; stimulant stomachic.

LEDUM PALUSTRE. *Rorismarini sylvestris herba.* Ross. Aust. prov. Bor.
Smell heavy, sub-aromatic; taste bitterish, sub-astringent; effects resolvent, diuretic.

LEPIDUM SATIVUM. *Folia, ſemina.* La G.
Antiſcorbutic, aperitive, diuretic.

LICHEN ISLANDICUS. Auſt. prov. *et* caſt. Brem. Roſſ. Gen. Bor. Mar. La G. Van M.
No ſmell; taſte bitteriſh, ſubaſtringent; effect nutritious.

LICHEN PULMONARIUS. La G.
Taſte ſaline, bitter; pectoral.

LIGUSTICUM LEVISTICUM. *Leviſtici herba, radix, ſemen.* Roſſ. Auſt. prov. Brem. Bor.
Smell unpleaſant; taſte warm, aromatic; effects ſtimulant, carminative, ſudorific.

LIQUIDAMBAR STYRACIFLUUM. *Styrax liquida. Balſamum.* Auſt. prov. Bor. Van M. La G.
Smell fragrant; taſte acrid, aromatic; effefts ſtimulating, heating.

LONICERA DIERVILLA. *Diervillæ ſtipites.* Roſſ.
Taſte and ſmell nauſeous; effects antivenereal.

LOPEZIANA. *Radix.* Van M.

LORANTHUS EUROPÆUS. *Viſcum quercinum, liguum.* Auſt. prov.
Smell nauſeous; taſte aſtringent, mucilaginous; effects tonic.

LUPINUS ALBUS. *Farina.* Gen.
Farinaceous; bitter.

LYCOPERDON BOVISTA. Roſſ.
No taſte or ſmell; effects mechanical, ſuppreſſion of hæmorrhagy.

LYCOPODIUM CLAVATUM. *Lycopodii ſemen.* Roſſ. Brem. Bor. La G.
No taſte or ſmell; effects abſorbent.

LYTHRUM SALICARIA. *Lyſimachia purpurea. Herba.* Brem. *Salicaria.* Auſt. prov.
No ſmell; taſte ſubaſtringent; effects aſtringent, tonic.

MALVA ROTUNDIFOLIA. *Folia et flores.* Gen.
Demulcent.

MANGANESIUM. *Manganeſium oxidatum nativum.* Bor. *Magneſia nigra.* Roſſ. *Magneſia vitrariorum.* Auſt. prov.

Ufed for the production of oxygen gas, oxymuriatic acid, and fome other chemical preparations.

MARANTA GALANGA. *Galangæ radix.* Roff. Auft. prov. Brem. Bor. Van M. La G.
Smell fragrant; tafte aromatic, pungent, biting; effects ftomachic, heating.

MATRICARIA CHAMOMILLA. V. Mons. *Chamomillæ vulgaris, flores, herba.* Roff. Auft. prov. *et* caft. Brem. Bor. Mar.
Smell ftrong; tafte bitter, warmifh; effects ftomachic, difcutient; fubftitute for chamomile.

MATRICARIA PARTHENIUM. *Matricaria. Flos, herba.* Auft. prov. Bor. Van M. La G.
Smell naufeous; tafte bitter; effects ftomachic.

MELISSA CALAMINTHA. *Folia.* La G.
Anti-hyfteric.

MELOE PROSCARABÆUS. Auft. prov. *Meloë majalis.* Brem. *Vermis majalis.* Roff. Bor.
No fmell; tafte acrid; effects ftimulating, diuretic, cauftic.

MENTHA CRISPA. *Herba.* Roff. Auft. prov. Brem. Gen. Mar. Van M.
Smell fragrant, ftrong; tafte warm, aromatic, flightly bitter; effects refolvent, ftomachic, carminative.

MENTHA AQUATICA. *Mentha rubra. Oleum diftillatum.* Auft. caft.
Similar to the former.

MERCURIALIS ANNUA. *Herba.* Van M. La G.
Purgative.

MIMOSA SENEGAL. *Arabicum gummi.* Brem.
Suppofed to produce the fineft gum-arabic.

MYROBALANUS CITRINA. *Cortex fructuum. Terminaliæ fpecies?* Auft. prov.
Tafte aftringent; effects aftringent.

NARCISSUS PSEUDO-NARCISSUS. *Flores.* Van M.
Fragrant; antifpafmodic.

NIGELLA SATIVA. *Nigella. Semen.* Brem. La G.
Smell fragrant; taſte acrid, aromatic; effects ſtimulating, errhine, ſialogogue, anthelmintic.

NYMPHÆA LUTEA. *Radix.* La G.
Demulcent.

OCIMUM BASILICUM. Van M. *Baſilici herba.* Bor.
Smell fragrant; expectorant.

ONONIS SPINOSA. *Ononis radix.* Auſt. prov. Mar.
No ſmell; taſte ſweetiſh; effects diuretic.

ONOPORDUM ACANTHIUM. *Cardui tomentoſi herba recens.* Roſſ.
No ſmell; taſte bitteriſh; effects ſpecific, the cure of cancerous affections.

ORCHIS MASCULA, MORIO, MILITARIS, MACULATA, PYRAMIDALIS, et LATIFOLIA. *Salep. Satyrium. Radix.* Roſſ. Auſt. prov. *et* caſt. Brem. Bor. Van M.
Taſte amylaceous; effects nutritious.

ORIGANUM DICTAMNUS. *Dictamnus Creticus. Herba.* Brem.
Smell ſlight, aromatic; taſte aromatic; effects ſtimulant.

ORYZA SATIVA. *Oryzæ ſemen decorticatum.* Roſſ. Van M.
Taſte farinaceous; effects nutritious, aſtringent.

PÆONIA OFFICINALIS. *Pæoniæ radix.* Roſſ. Brem. Bor. La G.
Smell unpleaſant; taſte at firſt ſweetiſh, then diſagreeably bitter; effects antiſpaſmodic.

PECHURIM FABA. *Ex Laura quadam.* Roſſ.
Smell fragrant, durable; taſte aromatic; effects ſtomachic, aſtringent.

PHELLANDRIUM AQUATICUM. *Semen.* Roſſ. *Fœniculum aquaticum.* Brem. Bor.
Smell heavy; taſte aromatic, acrid; effects ſtimulating, reſolvent.

PHOENIX DACTYLIFERA. *Fructus.* Van M. La G.
Demulcent.

PHYSALIS ALKEKENGI. *Bacca.* Van M. La G.
Diuretic.

PHYTOLACCA DECANDRA. *Phytolaccæ herba recens, radix.* Roff.
No ſmell; taſte acrid, corroſive; effects corroſive in cancer.

PIMPINELLA SAXIFRAGA. *Pimpinellæ albæ radix.* Roff. Auſt. prov. Brem. Bor. La G.
Smell fragrant; taſte warm, acrid; effects ſtomachic, diaphoretic, diuretic.

PINUS PINEA. *Pinus ſativa. Nuclei.* Auſt. prov.
Taſte ſweet, bland; effects nutritious.

PISTACIA VERA. *Fructus.* La G.
Nouriſhing; analeptic.

PLANTAGO MEDIA. *Plantago. Herba.* Auſt. prov.
Taſte ſubaſtringent; effects aſtringent.

PLANTAGO PSYLLIUM et CYNOPS. *Pſyllii ſemen.* Roff. Bor.
Taſte nauſeous, mucilaginous, then acrid; effects relaxant.

POLYGALA AMARA. *Herba, radix.* Roff. Brem. Gen. Bor. Van M.
No ſmell; taſte bitter, acidulous, mucilaginous; effects demulcent, roborant.

POLYGALA VULGARIS. *Polygala. Radix.* Auſt. prov. Mar.
Taſte ſweetiſh, bitter; effects tonic, expectorant; ſubſtitute for ſeneka.

POLYPODIUM VULGARE. *Polypodii radix.* Roff. Auſt. prov. Brem. Bor.
Taſte at firſt ſweet, then nauſeous, bitter, and aſtringent; effects demulcent, reſolvent.

POPULUS BALSAMIFERA. *Tacamahaca. Gummi reſina.* Roff. Van M.
Smell fragrant; taſte nauſeous, bitteriſh; effects ſtimulant, tonic.

POPULUS NIGRA. *Gemmæ.* Van M.
Emollient; ſoporiferous.

PRUNUS CERASUS. *Cerasorum rubrorum acidorum fructus.* Roff. Brem. Bor.
Taste acidulous, sweetish; effects refrigerating, antiseptic.

Cerasorum nigrorum aqua. Aust. prov.
Narcotic.

PRUNUS LAURO-CERASUS. *Lauro-cerasi folia.* Roff. Brem. Bor.
Smell fragrant; taste bitter, like that of bitter almonds; effects highly deleterious, narcotic, resolvent, diuretic.

PTERIS AQUILINA. *Filicis fœminæ radix.* Roff.
Smell nauseous; taste viscid, bitterish; effects anthelmintic.

PULMONARIA OFFICINALIS. *Folia.* La G.
Anthiphthysical.

PYRUS MALUS. *Poma acidula.* Bor. Van M.
Acidulous.

RANA ESCULENTA. La G.
Nutritious.

RHAMNUS ZIZYPHUS. *Fructus.* Van M.
Lubricant; expectorant.

RHEUM UNDULATUM. *Rhabarbari Sibirici radix.* Roff.
Smell slight; taste bitter and slightly astringent; effects stomachic, purgative.

RHEUM RHAPONTICUM. *Radix.* La G.
Astringent.

RUBUS ARCTICUS. *Baccæ.* Roff. La G.
Smell fragrant; taste acidulous, vinous; effects refrigerant, antiscorbutic. Similar properties are possessed by the fruits of the *rubus idæus, cæsius, fructicosus, chamæmorus.*

RUMEX AQUATICUS. *Lapathi aquatici radix.* Roff.
Taste austere, bitter; effects tonic, antiscorbutic.

RUMEX ACUTUS. *Lapathum acutum. Radix.* Aust. prof. Brem. Bor. Mar. Van M. La G.
Taste bitterish, acidulous; effects astringent.

SAGUS FARINARIA. *Medulla.* Van M.
Nutritious.

SALIX ALBA, PENTANDRA, FRAGILIS, VITELLINA. *Salicis cortex.* Roff. Bor. Mar.
Smell fragrant; tafte aftringent, bitter; effects tonic, febrifuge.

SALIVA HORMINUM. *Folia.* La G.
Aftringent, tonic.

SAMBUCUS EBULUS. *Ebulus. Radix.* Auft. prov.
Smell fetid; tafte naufeous, bitter, acrid; effects draftic, cathartic, emetic, narcotic.

SANICULA EUROPÆA. *Folia.* La G.
Harfh, herbaceous tafte.

SAPONARIA OFFICINALIS. *Saponariæ radix.* Roff. Auft. prov. *et* caft. Brem. Bor. Mar. Van M. La G.
No fmell; tafte flightly fweet, bitter, and glutinous; effects detergent.

SCABIOSA SUCCISA. *Radix.* La G.
Alexipharmic.

SCABIOSA ARVENSIS. *Scabiofa. Folium.* Auft. prov. Van M.
Tafte flightly bitter; effects expectorant, vulnerary.

SCANDIX CEREFOLIUM. *Cerefolii herba. Succus.* Brem. Auft. prov.
Smell weak, balfamic; tafte aromatic, balfamic; effects aperient, pectoral, diuretic.

SCORZONERA HISPANICA. *Scorzonera. Radix.* Auft. prov. Bor.
Tafte fweetifh; effects aperient, demulcent.

SCROPHULARIA NODOSA. *Scrophularia. Folium. Radix.* Auft. prov.
Smell unpleafant; tafte naufeous, bitter; effects attenuant.

SECALE CEREALE. *Secalis farina.* Auft. prov. Gen. Van M.
Tafte farinaceous; effects nutritious.

SEMPERVIVUM TECTORUM. *Sedi majoris folia virentia.* Roff. Auft. prov. Brem.
Smell weak; tafte fub-acrid, flightly ftyptic; effects refrigerant, aftringent.

SENECIO JACOBÆA. *Herba.* Van M.
Anthelmintic.

SEPIA OCTOPODA. *Sepiæ os.* Brem.
A carbonate of lime agglutinated by animal gluten.

SIUM SISARUM. *Ginſeng. Radix.*
Bitter ſweet, tonic.

SMILAX CHINA. *Chinæ radix.* Auſt. prov. Brem.
No ſmell; taſte mucilaginous; effects ſudorific, antivenereal.

SOLANUM NIGRUM. *Herba.* Bor. Van M. Mar.
Smell nauſeous; effects diuretic, narcotic.

SPIGELIA ANTHELMIA. *Herba cum radice.* Roſſ. Brem.
Taſte and ſmell fetid; effects narcotic, purgative, anthelmintic.

STRYCHNOS NUX VOMICA. *Nux vomica.* Bor. Van M. La G.
No ſmell; taſte intenſely bitter; effects tonic, narcotic, deleterious.

SYMPHITUM OFFICINALE. Van M. La G. *Symphiti radix.* Roſſ. *Conſolida major.* Auſt. prov. Brem.
No ſmell; taſte mucilaginous; effects emollient, inſpiſſant.

TESTUDO FEROX, &c. La G.
Nutritious.

TEUCRIUM CHAMÆDRYS. *Chamædryos herba.* Roſſ. Auſt. prov. Brem. La G.
Smell ſlightly fragrant; taſte bitter; effects tonic, emmenagogue.

TEUCRIUM CHAMÆPITYS. *Chamæpityos herba.* Roſſ.
Smell fragrant; taſte bitter and aromatic; effects tonic.

THEOBROMA CACAO. Van M. La G. *Cacao. Nucleus. Oleum.* Roſſ. Auſt. prov. Brem. Bor.
Little ſmell; taſte pleaſant and oily, very ſlightly aſtringent and bitteriſh; effects nutritious. Oil bland, ſweetiſh; effects emollient, lubricating.

THYMUS SERPYLLUM. *Serpylli herba.* Roff. Auft. prov. Brem. Bor. La G.
Smell fragrant; tafte aromatic, bitterifh; effects ftimulant, diuretic, emmenagogue.

THYMUS VULGARIS. *Thymi herba.* Roff. Brem La G.
Smell fragrant; tafte warm, pungent, bitter; effects ftimulant, diuretic, emmenagogue.

TILIA EUROPÆA. *Flores.* Van M. La G.
Fragrant; anodyne.

TRIFOLIUM MELILOTUS OFFICINALIS. *Meliloti herba cum floribus.* Roff. Auft. prov. Brem. Bor. Van M.
Smell fragrant; tafte herbaceous, bitterifh; effects difcutient.

TRITICUM REPENS. Van M. La G. *Graminis radix.* Roff. Auft. prov. *et* caft. Brem. Gen. Bor.
Smell herbaceous; tafte fweetifh; effects aperient, demulcent.

VACCINIUM MYRTILLUS. *Myrtilli baccæ.* Roff. Auft. prov.
No fmell; tafte acidulous, fub-aftringent; effects refrigerant, aftringent.

VACCINIUM OXYCOCCOS. *Oxycocci baccæ.* Roff.
Tafte acidulous; effects refrigerant.

VACCINIUM VITIS IDÆA. *Vitis idææ baccæ, folia.* Roff.
Tafte acidulous; effects refrigerant, antifeptic.

VERATRUM SABADILLA. Van. M. *Sabadillæ femen.* Roff. Auft. prov. *et* caft. Brem. Bor. Mar. La G.
Tafte very bitter, acrid, and cauftic; effects ftimulant, draftic, cathartic, anthelmintic, errhine.

VERBASCUM THAPSUS. Van. M. La G. *Verbafci flores, folia.* Roff. Auft. prov. Brem Bor. Mar.
Tafte of the leaves herbaceous, bitterifh; effects emollient, difcutient; fmell of the flowers fweet; tafte fweet; effects pectoral.

VERBENA OFFICINALIS. *Folia.* La G.
Vulnerary.

VERONICA OFFICINALIS. *Folia.* Van. M. La G.
Vulnerary; pectoral.

VICIA FABA. *Faba. Semen.* Auſt. prov.
Taſte farinaceous; effects nutritious.

VIOLA TRICOLOR. *Herba.* Roſſ. Auſt. prov. *Jacea. Herba.* Brem. Bor. Mar. Van M.
Smell agreeable; taſte mucilaginous, bitteriſh; effects anodyne.

VISCUM ALBUM. Bor. La G.
Glutinous; ſpecific; anti-paralytic; anti-epileptic.

VITIS VINIFERA APYRENA. *Paſſulæ minores.* Roſſ. Brem.
Taſte ſweet, acidulous; effects refrigerant, demulcent, lubricating.

No. II.

Liſt of Animals which furniſh Articles of the Materia Medica, arranged according to Cuvier's Syſtem.

MAMMALIA.

RODENTIA. Caſtor fiber.
PACHYDERMATA. Sus ſcrofa.
RUMINANTIA. Moſchus moſchiferus. Cervus elaphus. Ovis aries. Bos taurus.
CETACEA. Phyſeter macrocephalus.

AVES.

GALLINÆ. Phaſianus gallus.
ANSERES. Anas anſer.

PISCES.

CHONDROPTERYGII. Acipenſer ſturio, ſtellatus, huſo, ruthenus.

CRUSTACEA.

CANCERES. Cancer pagurus, aſtacus.

INSECTA.

COLEOPTERA. Lytta veſicatoria. (*Meloe veſicatorius.*) Meloe proſcarabæus.
HYMENOPTERA. Cyneps querci folii. Apis mellifera. Formica rufa.
HEMIPTERA. Coccus cacti.
GNATHAPTERA. Oniſcus aſellus.

MOLLUSCA.

CEPHALOPODA. Sepia officinalis.
ACEPHALA. Oſtrea edulis.

VERMES.

Hirudo medicinalis.

ZOOPHYTA.

CERATOPHYTA. Gorgonia nobilis. (*Iſis nobilis.*)
SPONGIA. Spongio officinalis.

No. III.

Liſt of the Genera of Medicinal Plants, arranged according to the Linnæan Syſtem.

Cl. I. MONANDRIA.
Ord. MONOGYNIA.
Kæmpferia.
Curcuma.
Amomum.
Coſtus.
Maranta.
Lopezia.

Cl. II. DIANDRIA.
Ord. MONOGYNIA.
Olea.
Veronica.
Gratiola.
Verbena.
Roſmarinus.
Salvia.

Cl. II. DIANDRIA.
Ord. Trigynia.
Piper.

Cl. III. TRIANDRIA.
Ord. Monogynia.
Valeriana.
Crocus.
Iris.
Ord. Digynia.
Saccharum.
Avena.
Secale.
Triticum.
Hordeum.

Cl. IV. TETRANDRIA.
Ord. Monogynia.
Scabiosa.
Plantago.
Penæa.
Rubia.
Fagara.
Santalum.
Alchemilla.
Dorstenia.
Ord. Digynia.
Cuscuta.

Cl. V. PENTANDRIA.
Ord. Monogynia.
Pulmonaria.
Symphitum.
Borago.
Cynoglossum
Anagallis.
Anchusa.
Spigelia.
Menyanthes.
Convolvulus.
Datura.
Hyosciamus.
Nicotiana.
Verbascum
Chironia.

Cl. V. PENTANDRIA.
Ord. Monogynia.
Cordia.
Strychnos.
Capsicum.
Solanum.
Physalis.
Atropa.
Cinchona.
Lobelia.
Psychotria.
Cephaëlis.
Lonicera.
Rhamnus.
Vitis.
Viola.
Ribes.
Hedera.
Ord. Digynia.
Gentiana.
Chenopodium.
Ulmus.
Eryngium.
Sanicula.
Daucus.
Conium.
Sium.
Cuminum.
Ferula.
Bubon.
Angelica.
Coriandrum.
Phellandrium.
Imperatoria.
Cicuta.
Carum.
Pastinaca.
Anethum.
Apium.
Pimpinella.
Ord. Trigynia.
Sambucus.
Rhus.
Ord. Pentagynia.
Linum.

Cl. VI. HEXANDRIA.

Ord. MONOGYNIA.

Loranthus.
Berberis.
Narciſſus.
Allium.
Aloë.
Convallaria.
Dracæna.
Scilla.
Aſparagus.
Lilium.
Acorus.
Calamus.

Ord. DIGYNIA.

Oryza.

Ord. TRIGYNIA.

Colchicum.
Rumex.

Cl. VII. HEPTANDRIA.

Ord. MONOGYNIA.

Æſculus.

Cl. VIII. OCTANDRIA.

Ord. MONOGYNIA.

Amyris.
Vaccinium.
Daphne.

Ord. TRIGYNIA.

Coccoloba.
Polygonum.

Cl. IX ENNEANDRIA.

Ord. MONOGYNIA.

Laurus.

Ord. TRIGYNIA.

Rheum.

Cl. X. DECANDRIA.

Ord. MONOGYNIA.

Myroxylon.
Toluifera.
Caſſia.
Guilandina.

Cl. X. DECANDRIA.

Ord. MONOGYNIA.

Dictamnus.
Hæmatoxylon.
Swietenia.
Guajacum.
Ruta.
Quaſſia.
Ledum.
Rhododendron.
Arbutus.
Styrax.
Copaifera.

Ord. DIGYNIA.

Saponaria.
Dianthus.

Ord. PENTAGYNIA.

Oxalis.

Ord. DECAGYNIA.

Phytolacca.

Cl. XI. DODECANDRIA.

Ord. MONOGYNIA.

Aſarum.
Garcinia.
Canella.
Portulaca.
Lythrum.

Ord. DIGYNIA.

Agrimonia.

Ord. TRIGYNIA.

Euphorbia.

Cl. XII. ICOSANDRIA.

Ord. MONOGYNIA.

Cactus.
Eugenia.
Myrtus.
Punica.
Eucalyptus.
Amygdalus.
Prunus.

Ord. PENTAGYNIA.

Pyrus.

Cl. XII. ICOSANDRIA.
Ord. POLYGYNIA.
Rosa.
Rubus.
Tormentilla.
Fragaria.
Potentilla.
Geum.

Cl. XIII. POLYANDRIA.
Ord. MONOGYNIA.
Papaver.
Chelidonium.
Cistus.
Tilea.
Nymphæa.
Ord. DIGYNIA.
Pæonia.
Ord. TRIGYNIA.
Delphinium.
Aconitum.
Ord. TETRAGYNIA.
Wintera.
Ord. PENTAGYNIA.
Nigella.
Ord. POLYGYNIA.
Clematis.
Helleborus.

Cl. XIV. DIDYNAMIA.
Ord. GYMNOSPERMIA.
Glecoma.
Hyssopus.
Mentha.
Lavandula.
Teucrium.
Lamium.
Satureja.
Marrubium.
Thymus.
Ocimum.
Origanum.
Melissa.
Ord. ANGIOSPERMIA.
Euphrasia.
Scrophularia.
Digitalis.

Cl. XV. TETRADYNAMIA.
Ord. SILICULOSÆ.
Cochlearia.
Lepidium.
Raphanus.
Cardamine.
Sinapis.
Sisymbrium.

Cl. XVI. MONADELPHIA.
Ord. TRIANDRIA.
Tamarindus.
Ord. POLYANDRIA.
Malva.
Althæa.

Cl. XVII. DIADELPHIA.
Ord. HEXANDRIA.
Fumaria.
Ord. OCTANDRIA.
Polygala.
Ord. DECANDRIA.
Pterocarpus.
Spartium.
Genista.
Lupinus.
Dolichos.
Astragalus.
Trifolium.
Glycyrrhiza.
Geoffroya.
Trigonella.

Cl. XVIII. POLYADELPHIA.
Ord. DECANDRIA.
Theobroma.
Ord. ICOSANDRIA.
Citrus.
Ord. POLYANDRIA.
Melaleuca.
Hypericum.

Cl. XIX. SYNGENESIA.
Ord. POLYGAMIA ÆQUALIS.
Cichoreum.
Scorzonera.

Cl. XIX. SYNGENESIA.

Ord. POLYGAMIA ÆQUALIS.

Leontodon.
Lactuca.
Carlina.
Arctium.
Carthamus.
Cynara.
Carduus.

Ord. POLYGAMIA SUPERFLUA.

Artemisia.
Tanacetum.
Bellis.
Matricaria.
Arnica.
Inula.
Solidago.
Senecio.
Tussilago.
Anthemis.
Achillea.

Ord. POLYGAMIA FRUSTRANEA.

Centaurea.

Ord. POLYGAMIA NECESSARIA.

Calendula.

Cl. XX. GYNANDRIA.

Ord. DIANDRIA.

Orchis.
Epidendrum.

Ord. HEXANDRIA.

Aristolochia.

Ord. DODECANDRIA.

Cytinus.

Ord. POLYANDRIA.

Arum.

Cl. XXI. MONOECIA.

Ord. TETRANDRIA.

Betula.
Morus.
Urtica.

Ord. POLYANDRIA.

Quercus.

Cl. XXI. MONOECIA.

Ord. POLYANDRIA.

Juglans.
Liquidamber.

Ord. MONADELPHIA.

Pinus.
Ricinus.
Croton.

Ord. SYNGENESIA.

Momordica.
Cucumis.
Cucurbita.
Bryonia.

Cl. XXII. DIOECIA.

Ord. DIANDRIA.

Salix.

Ord. TETRANDRIA.

Viscum.

Ord. PENTANDRIA.

Pistacia.
Cannabis.
Humulus.

Ord. HEXANDRIA.

Smilax.

Ord. OCTANDRIA.

Populus.

Ord. MONADELPHIA.

Juniperus.
Cissampelos.

Cl. XXIII. POLYGAMIA.

Ord. MONOECIA.

Veratum.
Mimosa.
Parietaria.

Ord. DIOECIA.

Fraxinus.
Panax.

Ord. TRIOECIA.

Ficus.
Ceratonia.

Cl. XXIV. CRYPTOGAMIA.

Ord. FILICES.

Polypodium.
Adiantum.

Cl. XXIV. CRYPTOGAMIA.

Ord. Musci.

Lycopodium.

Ord. Algæ.

Lichen.

Conferva.

Ord. Fungi.

Agaricus.

Cl. XXIV. CRYPTOGAMIA.

Ord. Fungi.

Boletus.

Lycoperdon.

Cl. XXV. PALMÆ.

Cocos.

Phœnix.

Sagus.

List of Officinal Genera, arranged according to the Natural System of Jussieu, improved by Ventenat.

Cl. I. ACOTYLEDONES.

Ord. 1. Fungi.

Lycoperdon.

Boletus

Agaricus.

2. Algæ.

Conferva.

Lichen.

Plataphyllum.

Ord. 3. Hepaticæ.

4. Musci.

Lycopodium.

5. Filices.

Polypodium.

Pteris.

Adiantum.

Cycas.

MONOCOTYLEDONES.

Cl II. *Stamina hypogynia.*

Ord. 1. Pluviales.

2. Aroideæ.

Arum.

Acorus.

3. Typhoideæ.

4. Cyperoideæ.

5. Gramineæ.

Saccharum.

Lolium.

Hordeum.

Triticum.

Secale.

Avena.

Oryza.

Cl. III. *Perigynia.*

Ord. 1. Palmæ.

Calamus.

Areca.

Cocos.

Sagus.

Phœnix.

2. Asparagoideæ.

Dracæna.

Asparagus.

Convallaria.

3. Smilaceæ.

Smilax.

4. Ioncaceæ.

Veratrum.

Colchicum.

MONOCOTYLEDONES.

Cl. III. *Perigynia.*
Ord. 5. ALISMOIDEÆ.
6. LILIACEÆ.
a. Asphodeloideæ.
Scilla.
Allium.
b. Gloriosæ.
Lilium.
c. Aloideæ.
Aloë.
7. NARCISSOIDÆ.
Narcissus.

Cl. III. *Perigynia.*
Ord. 8. IRIDEÆ.
Iris.
Crocus.

Cl. IV. *Epigynia.*
Ord. 1. SCITAMINEÆ.
2. DRYMYRRHIZÆ.
Amomum.
Kæmpferia.
3. ORCHIDEÆ.
Orchis.
Vanilla.
4. HYDROCHARIDEÆ.

DICOTYLEDONES.

A. *Flores apetali.*

Cl. V. *Epigynia.*
ORD. 1. ASAROIDEÆ.
Aristolochia.
Asarum.
Cytinus.

Cl. VI. *Perigynia.*
1. ELÆAGNOIDEÆ.
2. DAPHNOIDEÆ.
Daphne.
3. PROTEOIDEÆ.
4. LAURINEÆ.
Laurus.
Myristica.
5. POLYGONEÆ.
Coccoloba.
Polygonum.

Cl. VI. *Perigynia.*
Ord. 5. POLYGONEÆ.
Rumex.
Rheum.
6. CHENOPODEÆ.
Phytolacca.
Chenopodium.

Cl. VII. *Hypogynia.*
Ord. 1. AMARANTHOIDEÆ.
2. PLANTAGINEÆ.
Plantago.
Psyllium.
3. NYCTAGINEÆ.
Mirabilis.
4. PLUMBAGINEÆ.

B. *Monopetali.*

Cl. VIII. *Hypogynia.*
Ord. 1. PRIMULACEÆ.
2. OROBANCHOIDEÆ.
3. RHINANTHOIDEÆ.
Polygala.
Veronica.

Cl. VIII. *Hypogynia.*
Ord. 4. ACANTHOIDEÆ.
5. LILACEÆ.
Fraxinus.
6. IASMINEÆ.
Olea.

DICOTYLEDONES.

B. *Monopetali.*

Cl. VIII. *Hypogynia.*

Ord. 7. PYRENACEÆ.

8. LABIATÆ.
   - Rofmarinus.
   - Salvia.
   - Teucrium.
   - Hyffopus.
   - Lavandula.
   - Mentha.
   - Glecoma.
   - Marrubium.
   - Origanum.
   - Thymus.
   - Meliffa.
   - Ocimum.

9. PERSONATÆ.
   - Digitalis.
   - Gratiola.

10. SOLANEÆ.
    - Hyofciamus.
    - Nicotiana.
    - Datura.
    - Atropa.
    - Solanum.
    - Capficum.

11. SEBESTENÆ.
    - Cordia.

12. BORRAGINEÆ.
    - Anchufa.

13. CONVOLVULACEÆ.
    - Convolvulus.

14. POLEMONACEÆ.

15. BIGNONEÆ.

16. GENTIANEÆ.
    - Menyanthes.
    - Gentiana.
    - Chironea.
    - Spigelia.

Cl. VIII. *Hypogynia.*

Ord. 17. APOCINEÆ.
   - Afclepias.

18. HILOSPERMÆ.

Cl. IX. *Perigynia.*

1. EBENACEÆ.
   - Styrax.

2. RHODORACEÆ.
   - Rhododendron.
   - Ledum.

Cl. IX. *Perigynia.*

3. BICORNES.
   - Arbutus.
   - Vaccinium.

4. CAMPANULACEÆ.
   - Lobelia.

Cl. X. *Epigynia*, with united antheræ.

1. CICHORACEÆ.
   - Lactuca.
   - Taraxacum.
   - Cichorium.
   - Scolymus.

2. CINAROCEPHALÆ.
   - Cinara.
   - Arctium.
   - Centaurea.

3. CORYMBIFERÆ.
   - Anthemis.
   - Achillea.
   - Solidago.
   - Inula.
   - Tuffilago.
   - Arnica.
   - Matricaria.
   - Tanacetum.

DICOTYLEDONES.
B. *Monopetali.*

Cl. X. *Epigynia*, with united antheræ.

Ord. 3. CORYMBIFERÆ.
- Artemisia.
- Absinthium.

XI. *Epigynia*, with distinct antheræ.

Ord. 1. DISPASCEÆ.
- Valeriana.

2. RUBIACEÆ.
- Galium.

Cl. XI. *Epigynia*, with distinct antheræ.

Ord. 2. RUBIACEÆ.
- Rubia.
- Cinchona.
- Psychotria.
- Coffea.

3. CAPRIFOLIACEÆ.
- Diervilla.
- Sambucus.
- Cornus.
- Hedera.

DICOTYLEDONES.
C. *Polypetali.*

Cl. XII. *Epigynia.*

Ord. 1. ARALIACEÆ.
- Panax.

2. UMBELLIFERÆ.
- Pimpinella.
- Carum.
- Apium.
- Anethum.
- Pastinaca.
- Imperatoria.
- Scandix.
- Coriandrum.
- Phellandrium.
- Cuminum.
- Bubon.
- Sium.
- Angelica.
- Sigusticum.
- Ferula.
- Cicuta.
- Daucus.
- Eryngium.

Cl. XIII. *Hypogynia.*

Ord. 1. RAUNCULACEÆ.
- Clematis.
- Helleborus.
- Delphinium.

Cl. XIII. *Hypogynia.*

Ord. 1. RANUNCULACEÆ.
- Aconitum.

2. TULIPIFERÆ.
- Illicium.

3. GLYPTOSPERMÆ.

4. MENISPERMOIDÆ.

5. BERBERIDEÆ.
- Berberis.

6. PAPAVERACEÆ.
- Papaver.
- Chelidonium.
- Fumaria.

7. CRUCIFERÆ.
- Raphanus.
- Sinapis.
- Sisymbrium.
- Cardamine.
- Cochlearia.
- Nasturtium.

8. CAPPARIDEÆ.

9. SAPONACEÆ.

10. MALPIGHIACEÆ.
- Hippocastanum.

11. HYPERICOIDEÆ.
- Hypericum.

12. GOTTIFERÆ.
- Mangostana.

DICOTYLEDONES.
C. *Polypetali.*

Cl. XIII. *Hypogynia.*
Ord. 13. HESPERIDEÆ.
Citrus.
14. MELIACEÆ.
Canella.
Swietenia.
15. SARMENTACEÆ.
Vitis.
16. GERANIOIDEÆ.
Oxalis.
17. MALVACEÆ.
Malva.
Althœa.
Hibiſcus.
Theobroma.
18. TILIACEÆ.
Tilia.
19. CISTOIDEÆ.
Ciſtus.
Viola.

Cl. XIII. *Hypogynia.*
Ord. 20. RUTACEÆ.
Guaiacum.
Ruta.
Dictamnus.
21. CARYOPHYLLEÆ.
Dianthus.
Linum.

Cl. XIV. *Perigynia.*
1. PORTULACEÆ.
2. FICOIDEÆ.
3. SUCCULENTÆ.
Sedum.
4. SAXIFRAGEÆ.
Ribes.
5. CACTOIDEÆ.
Cactus.

PART III.

PREPARATIONS AND COMPOSITIONS

CHAP. I.

SULPHUR.

SULPHUR SUBLIMATUM LOTUM. *Edin.*

FLORES SULPHURIS LOTI. *Lond.*
Washed Sublimed Sulphur. Washed Flowers of Sulphur.

Take
Sublimed sulphur, one pound;
Water, four pounds.

Boil the sulphur for a little in the water, then pour off this water, and wash away all the acid by affusions of cold water; and lastly, dry the sulphur.

SULPHUR SUBLIMATUM LOTUM. *Dub.*
Washed Sublimed Sulphur.

Let warm water be poured upon sublimed sulphur, and the washing be repeated as long as the water, when poured off, is impregnated with acid.

When dried, it is to be kept in well-closed vessels.

As it is impossible to sublime sulphur in vessels perfectly void of air, a small portion of it is always acidified and converted into sulphurous or sulphuric acid. The presence of acid in sulphur, is always to be considered as an impurity, and must be removed by careful ablution. When thoroughly washed, sublimed sulphur is not acted upon by the atmosphere; there is therefore no particular reason for preserving it from the action of the air; for if, on keeping, it become moist, it is because the sulphuric acid has not been entirely washed away.

Off. prep.—Trochisci. *Lond.*

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SULPHUR PRÆCIPITATUM. *Lond*
Precipitated Sulphur.

Take of

Sulphurated kali, six ounces;

Distilled water, one pound and an half;

Diluted vitriolic acid, as much as is sufficient.

Boil the sulphuretted kali in the distilled water until it be dissolved. Filter the liquor through paper, to which add the diluted vitriolic acid. Wash the precipitated powder by repeated affusions of water till it become insipid.

Dub.

Take of

Sulphuretted vegetable alkali, four ounces;

Boiling water, a pound and a half;

Diluted nitrous acid, as much as may be sufficient.

Dissolve the sulphuretted vegetable alkali in the water, and add the acid to the filtered liquor as long as the liquor is rendered turbid by its addition. Wash the precipitated powder well with warm water, and keep it after it is dried in well-closed vessels.

Instead of dissolving sulphuret of potass in water, we may gradually add sublimed sulphur to a boiling solution of potass, until it be saturated.

When the sulphuretted potass is thrown into water, it is entirely dissolved, but not without decomposition, for it is converted into sulphate of potass, hydroguretted sulphuret of potass, and sulphuretted hydroguret of potass. The two last compounds are again decomposed on the addition of any acid. The acid combines with the potass, sulphuretted hydrogen flies off in the form of gas, while sulphur is precipitated. It is of little consequence what acid is employed to precipitate the sulphur. The London college order the sulphuric; while the Dublin college use nitrous acid, probably because the nitrate of potass formed, is more easily washed away than sulphate of potass.

Precipitated sulphur does not differ from well-washed sublimed sulphur, except in being much dearer. Its paler colour is owing to its more minute division, or according to Dr. Thomson, to the presence of a little water; but from either circumstance it derives no superiority to compensate for the disagreeableness of its preparation.

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CHAP. II.

ACIDS.

ACIDUM SULPHURICUM DILUTUM. *Edin.*
Diluted Sulphuric Acid.

Take of
Sulphuric acid, one part;
Water, feven parts.
Mix them.

Acidum Vitriolicum Dilutum. *Lond.*
Diluted or weak Vitriolic Acid.

Take of
Vitriolic acid, one ounce;
Diftilled water, eight ounces.
Mix them by degrees.

Dub.

Take of
Vitriolic acid, two ounces;
Diftilled water, fourteen ounces.
Having gradually mixed them, fet them afide to cool, and then pour off the clear liquor.

The moft fimple form in which fulphuric acid can be advantageoufly employed internally, is that in which it is merely diluted with water: and it is highly proper that there fhould be fome fixed ftandard in which the acid in this ftate fhould be kept. It is, however, much to be regretted, that the colleges have not adopted the fame ftandard with refpect to ftrength: for in the Edinburgh and Dublin colleges, the ftrong acid conftitutes an eighth; and in the London, only a ninth of the mixture. The former proportion feems preferable, as it gives exactly a drachm of acid to the ounce; but the dilution by means of diftilled water is preferable to fpring water; which, even in its pureft ftate, is not free from impregnations affecting the acid. Even when diftilled water is ufed, there is often a fmall quantity of a white precipitate, arifing from lead diffolved in the acid.

Sulphuric acid has a very ftrong attraction for water; and their bulk when combined is lefs than that of the water and acid feparately. At the fame time, there is a very confiderable increafe of temperature produced, which is apt to crack glafs veffels, unlefs the combination be very cautioufly made; and for the fame reafon, the acid muft be poured into the water, not the water into the acid.

Off. Prep.—Acid. Benzoic. *Ed.* Aqua aeris fixi. *Dub.*

ACIDUM NITROSUM. *Edin.*

Nitrous Acid.

Take of
Very pure nitrate of potafs, two pounds;
Sulphuric acid, fixteen ounces.

Having put the nitrate of potafs into a glafs retort, pour upon it the fulphuric acid, and diftil in a fand bath, with a heat gradually increafed, until the iron pot begins to be red-hot.

The fpecific gravity of this acid is to that of diftilled water as 1550 to 1000.

Lond.

Take of
Purified nitre, by weight, fixty ounces;
Vitriolic acid, by weight, twenty-nine ounces.

Mix and diftil.

The fpecific gravity of this is to the weight of diftilled water as 1550 to 1000.

Dub.

Take of
Nitre, fix pounds;
Vitriolic acid, three pounds.

Mix and diftil, until the refiduum becomes dry

The fpecific gravity of the acid is to the weight of diftilled water as 1550 to 1000.

In this procefs, the fulphuric acid, by its fuperior affinity, combines with the potafs of the nitre to form fulphate of potafs, while the nitric acid is feparated, and is not only converted into vapour by the application of the heat to the retort, but is alfo partially decompofed. A portion of oxygen efcapes in a gafeous form, and the nitric oxide gas combines with the nitric acid; fo that the liquor condenfed in the receiver is nitrous and not nitric acid.

In performing this procefs, we muft take care, in pouring in the fulphuric acid, not to foil the neck of the retort. Inftead of a common receiver, it is of advantage to ufe fome modification of Woulfe's apparatus, and as the vapours are extremely corrofive, the fat lute muft be ufed to connect the retort with it. The difference of the proportions of the ingredients directed by the different colleges, has no effect on the quality of the acid obtained, but only affects the refiduum. The London and Dublin colleges ufe no more fulphuric acid than what is neceffary to expel all the nitric acid, and the refiduum is a neutral fulphate of potafs, fo infoluble, that it cannot be got out without breaking the retort. The Edinburgh college order as much fulphuric acid as renders the refiduum, an acidulous fulphate of potafs, eafily foluble in water.

Nitrous acid is frequently impure. Sulphuric acid is eafily got rid of by re-diftilling the nitrous acid from a fmall quantity of ni-

trate of potaſs. But its preſence is not indicated when nitrous acid forms a precipitate with nitrate of baryta, as affirmed by almoſt all chemical authors; for nitrate of baryta was diſcovered by Mr. Hume to be inſoluble in nitrous acid.

Muriatic acid is detected by the precipitate formed with nitrate of ſilver, and may be ſeparated by dropping into the nitrous acid a ſolution of nitrate of ſilver, as long as it forms any precipitate, and drawing off the nitrous acid by diſtillation.

The general properties of nitrous acid have been already noticed. Mr. Davy has ſhewn that it is a compound of nitric acid and nitric oxide, and that by additional doſes of the laſt conſtituent, its colour is ſucceſſively changed, from yellow to orange, olive green, and blue green, and its ſpecific gravity is diminiſhed. The ſpecific gravity is probably ſtated too high by the colleges; for although Rouelle makes that of the ſtrongeſt nitric acid 1.583, yet Kirwan could produce it no ſtronger at 60° than 1.5543, and Mr. Davy makes it only 1.504, and when ſaturated with nitric oxide only 1.475.

Off. Prep.—Spiritus æth. nitroſ. *Ed. Lond. Dub.*

ACIDUM NITROSUM DILUTUM. *Lond. Dub. Ed.*
Diluted Nitrous Acid.

Take of
Nitrous acid,
Water, equal weights.
Mix them, taking care to avoid the noxious vapours.

Nitrous acid has a great affinity for water, and attracts it from the atmoſphere. During their combination there is an increaſe of temperature, part of the nitric oxide is diſſipated in the form of noxious vapours, and the colour changes ſucceſſively from orange to green, and to blue, according as the proportion of water is increaſed. A mixture of equal parts of Kirwan's ſtandard acid of 1.5543 and water, has the ſpecific gravity 1.1911.

Off. Prep.—Sulph. præc. *Dub.* Nitras argenti, *Ed. Lond. Dub.* Acetis hyd. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.* Oxid. hyd. cin. *Ed. Dub.* Oxidum hyd. rubr. per acid. nitric. *Ed. Lond. Dub.*

ACIDUM NITRICUM. *Ed.*
Nitric acid.

Take of
Nitrous acid, any quantity.
Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddeſt portion ſhall have paſſed over, and the acid which remains in the retort ſhall have become nitric acid.

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We have already ſtated, that nitrous acid is nitric acid combined with a variable proportion of nitric oxide. Now, by the application of a gentle heat, the whole of the nitric oxide is vaporized, and pure colourleſs nitric acid remains in the retort. The nitric oxide, however, carries over with it a portion of the acid, and condenſes with it in the receiver, in the form of a very high-coloured nitrous acid.

Richter has given the following manner of preparing nitric acid.

Take of

Purified nitrate of potaſs, ſeven pounds;
Black oxide of manganeſe, one pound two ounces;
Sulphuric acd, four pounds, four ounces, and ſix drachms.

Into a retort capable of containing twenty-four pounds, introduce the nitre and manganeſe, powdered and mixed, and pour upon them gradually, through a retort-funnel, the ſulphuric acid. Lute on the receiver with flour and water, and conduct the diſtillation with a gradually increaſed heat.

From theſe proportions, Richter got three pounds nine ounces of very ſlightly-coloured nitric acid. The operation will be conducted with leſs hazard in a Woulfe's apparatus, or by interpoſing between the retort and a receiver a tubulated adopter, furniſhed with a bent tube, of which the further extremity is immerſed in a veſſel containing a ſmall quantity of water.

These acids, the nitrous and nitric, have been long employed as powerful pharmaceutic agents. Their application in this way I ſhall have many opportunities of illuſtrating.

Medical uſe.—Lately, however, their uſe in medicine has been conſiderably extended. In the ſtate of vapour they have been uſed to deſtroy contagion in jails, hoſpitals, ſhips, and other places where the accumulation of animal effluvia is not eaſily avoided. The fumigating ſuch places with the vapour of nitrous acid has certainly been attended with ſucceſs; but we have heard that ſucceſs aſcribed entirely to the ventilation employed at the ſame time. Ventilation may unqueſtionably be carried ſo far, that the contagious miaſmata may be diluted to ſuch a degree that they ſhall not act on the body; but to us it appears no leſs certain, that theſe miaſmata cannot come in contact with nitric acid or oxy-muriatic acid vapour, without being entirely decompoſed and completely deſtroyed. Fumigation is, beſides, applicable in ſituations which do not admit of ſufficient ventilation; and where it is, the previous diffuſion of acid vapours is an excellent check upon the indolence and inattention of ſervants and nurſes, as by the ſmell we are enabled to judge whether they have been ſufficiently attentive to the ſucceeding ventilation. Nitric acid vapour, alſo, is not deleterious to life, and may be diffuſed in the apartments of the ſick,

without occaſioning to them any material inconvenience. The means of diffuſing it are eaſy. Half an ounce of powdered nitre is put into a ſaucer, which is placed in a pipkin of heated ſand. On the nitre two drachms of ſulphuric acid are then poured. The fumes of nitric acid immediately begin to riſe. This quantity will fill with vapour a cube of ten feet; and by employing a ſufficient number of pipkins, the fumes may be eaſily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Carmichael Smyth received from the Britiſh parliament a reward of five thouſand pounds.

The internal uſe of theſe acids has alſo been lately much extended. In febrile diſeaſes, water acidulated with them forms one of the beſt antiphlogiſtic and antiſeptic drinks we are acquainted with. Hoffmann and Eberhard long ago employed it with very great ſucceſs in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the ſuburbs of Edinburgh, I have repeatedly given it with unequivocal advantage. In the liver complaint of the Eaſt-Indies, and in ſyphilis, nitric acid has alſo been extolled as a valuable remedy by Dr. Scott, and the evident benefits reſulting from its uſe in theſe complaints has given riſe to a theory, that mercury only acts by oxygenizing the ſyſtem. It is certain that both the primary and ſecondary ſymptoms of ſyphilis have been removed by the uſe of theſe acids, and that the former ſymptoms have not returned, or been followed by any ſecondary ſymptoms. But in many inſtances they have failed, and it is doubtful if ever they effected a permanent cure, after the ſecondary ſymptoms appeared. Upon the whole, the opinions of Mr. Pearſon on this ſubject, lately agitated with ſo much keenneſs, appear to us ſo candid and judicious, that we ſhall inſert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the ſame time, he by no means wiſhes to ſee it exploded as a medicine altogether uſeleſs in that diſeaſe. When an impaired ſtate of the conſtitution renders the introduction of mercury into the ſyſtem inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of reſtraining the progreſs of the diſeaſe, while, at the ſame time, it will improve the health and ſtrength of the patient. On ſome occaſions, this acid may be given in conjunction with a mercurial courſe, and it will be found to ſupport the tone of the ſtomach, to determine powerfully to the kidneys, and to counteract in no inconſiderable degree the effects of mercury on the mouth and fauces.

ACIDUM MURIATICUM. *Edin.*
Muriatic Acid.

Take of
Muriate of ſoda, two pounds;
Sulphuric acid, ſixteen ounces;
Water, one pound.

Heat the muriate of ſoda for ſome time red-hot in a pot, and after it has cooled, put it into a retort. Then pour upon the muriate of ſoda the acid mixed with the water and allowed to cool. Laſtly, diſtil in a ſand bath, with a moderate fire, as long as any acid is produced.

The ſpecific gravity of this acid is to that of diſtilled water as 1170 to 1000.

Lond.

Take of
Dried ſea-ſalt, ten pounds;
Vitriolic acid, ſix pounds;
Water, five pounds.

Add by degrees the vitriolic acid, firſt mixed with the water, to the ſalt; then diſtil.

The ſpecific gravity of this acid is to that of diſtilled water as 1170 to 1000.

Dub.

Take of
Common ſalt, dried, five pounds;
Vitriolic acid,
Water, each three pounds.

Add the acid, diluted with the water, after it has cooled, gradually to the ſalt, and then diſtil the liquor, until the reſiduum become dry.

The ſpecific gravity of this acid is to that of diſtilled water, as 1160 to 1000.

In this proceſs the muriate of ſoda is decompoſed, and the muriatic acid diſengaged by the ſuperior affinity of the ſulphuric acid. But as muriatic acid is a permanently elaſtic fluid, the addition of the water is abſolutely neceſſary for its exiſtence in a fluid form. Some operators put a portion of water into the receiver, for the purpoſe of abſorbing the muriatic acid gas, which is firſt diſengaged; the colleges, however, order the whole of the water to be previouſly mixed with the ſulphuric acid. This mixture muſt not be made in the retort itſelf; for the heat produced is ſo great, that it would not only endanger the breaking of the veſſel, but occaſion conſiderable loſs and inconvenience by the ſudden diſengagement of muriatic gas.

The muriate of ſoda is directed to be heated to redneſs before it be introduced into the retort, that the whole of the water of

cryſtallization may be expelled, which being variable in quantity, would otherwiſe affect the ſtrength of the acid produced; and beſides, without this precaution, the acid obtained is too high-coloured.

If a common retort and receiver be employed for this diſtillation, they muſt not be luted perfectly cloſely; for if any portion of the gas ſhould not be abſorbed by the water employed, it muſt be allowed to eſcape; but the proceſs will be performed with greater economy, and perfect ſafety, in a Woulfe's, or ſome ſimilar apparatus.

The reſiduum in the retort conſiſts principally of ſulphate of ſoda, which may be purified by ſolution and cryſtallization.

If properly prepared, the muriatic acid is perfectly colourleſs, and poſſeſſes the other properties already enumerated; but in the ſhops it is very ſeldom found pure. It almoſt always contains iron, and very frequently ſulphuric acid or copper. The copper is detected by the blue colour produced by ſuper-ſaturing the acid with ammonia, the iron by the black or blue precipitate formed with tincture of galls or pruſſiate of potaſs. The ſulphuric acid may be eaſily got rid of by re-diſtilling the acid from a ſmall quantity of dried muriate of ſoda. But Mr. Hume diſcovered that muriate of baryta is precipitated when poured into muriatic acid, although it contain no ſulphuric acid.

Medical uſe.—In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almoſt proves that they do not act by oxygenizing the ſyſtem, as the muriatic acid cannot be diſoxygenized by any ſubſtance or proceſs with which we are acquainted.

Off. prep.—Sulphas ſodæ, *Ed. Lond. Dub.* Hydro-ſulph. ammon. *Ed.* Murias barytæ, *Ed.* Solutio muriat. calcis, *Ed.*

Oxygenized Muriatic Acid.

THE vapours of this powerfully-oxygenizing acid have been recommended by Morveau as the beſt means of deſtroying contagion. As, however, they are deleterious to animal life, they cannot be employed in every ſituation. Where applicable, they are eaſily diſengaged by mixing together ten parts of muriate of ſoda, and two parts of black oxide of mangeneſe in powder, and pouring upon the mixture firſt four parts of water, and then ſix parts of ſulphuric acid. Fumes of oxygenized muriatic acid are immediately diſengaged.

Morveau has ſince contrived what he calls Diſ-infecting or Preſervative phials. If intended to be portable, 46 grains of black oxide of manganeſe in coarſe powder, are to be put into a ſtrong glaſs phial of about 2^3 cubic inches capacity, with an accurately-ground ſtopper, to which muſt be added about $\frac{45}{100}$ of a cubic inch

of nitric acid of 1.4 ſpecific gravity, and an equal bulk of muriatic acid of 1.134, the ſtopper is then to be replaced, and the whole ſecured by incloſing the phial in a ſtrong wooden caſe, with a cap which ſcrews down ſo as to keep the ſtopper in its place. They are to be uſed by ſimply opening the phial without approaching it to the noſe, and ſhutting it as ſoon as the ſmell of the muriatic gas is perceived. A phial of this kind, if properly prepared, will not loſe its power after many years uſe. For ſmall wards, ſtrong bottles, with ground ſtoppers an inch in diameter, of about 25 or 27 cubic inches of capacity, may be uſed, with 372 grains of the oxide, and 3.5 inches of each of the acids, and the ſtopper kept in its place by leaden weights; or for larger wards, very ſtrong glaſs jars, about 43 cubic inches in capacity, containing a drachm of the oxide, and 6 inches of each of the acids. Theſe jars are to be covered with a plate of glaſs, adjuſted to them by grinding with emery, and kept in its place by a ſcrew. In no caſe is the mixture to occupy more than one third of the veſſel.

ACIDUM ACETOSUM DESTILLATUM. *Ed.*
Diſtilled Acetous Acid.

Let eight pounds of acetous acid be diſtilled in glaſs-veſſels, with a gentle heat. The two firſt pounds which come over, being too watery, are to be ſet aſide; the next four pounds will be the diſtilled acetous acid. The remainder furniſhes a ſtill ſtronger acid, but too much burnt by the fire.

ACETUM DESTILLATUM. *Dub.*
Diſtilled Vinegar.

Take of
Vinegar, ten pounds.
Draw off, with a gentle heat, ſix pounds.
The ſpecific gravity of this acid is to the weight of diſtilled water as 1004 to 1000.

Lond.

Take of
Vinegar, five pounds.
Diſtil with a gentle fire, in glaſs veſſels, ſo long as the drops fall free from empyreuma.

VINEGAR, when prepared from vinous liquors by fermentation, beſides acetous acid and water, contains extractive, ſuper-tartrate of potaſs, and often citric or malic acid, alcohol, and a peculiar agreeable aroma. Theſe ſubſtances, particularly the extractive and ſuper-tartrate of potaſs, render it apt to ſpoil, and unfit for pharmaceutic and chemical purpoſes. By diſtillation, however, the acetic acid is eaſily ſeparated from ſuch of theſe ſubſtances as are not volatile. But by diſtillation it loſes its agreeable flavour,

and becomes confiderably weaker; for the water being rather more volatile than acetic acid, comes over firft, while the laft and ftrongeft portion of the acid cannot be obtained free from empyreuma.

This procefs may be performed either in a common ftill or rather in a retort. The better kinds of wine-vinegar fhould be ufed. Indeed, with the beft kind of vinegar, if the diftillation be carried on to any great length, it is extremely difficult to avoid empyreuma. The beft method of preventing this inconvenience is, if a retort be ufed, to place the fand but a little way up its fides, and when fomewhat more than half the liquor is come over, to pour on the remainder a quantity of frefh vinegar equal to the liquor drawn off. This may be repeated three or four times; the vinegar fupplied at each time being previoufly heated. The addition of cold liquor would not only prolong the operation, but alfo endanger the breaking of the retort.

Lowitz recommends the addition of half an ounce of recently-burnt and powdered charcoal to each pound of vinegar in the ftill, as the beft means of avoiding empyreuma.

If the common ftill be employed, it fhould likewife be occafionally fupplied with frefh venegar, in proportion as the acid runs off, and this continued until the procefs can be conveniently carried no farther. The diftilled acid muft be rectified by a fecond diftillation in a retort or glafs alembic; for although the head and receiver be of glafs or ftone ware, the acid will contract a metallic taint from the pewter worm.

The refiduum of this procefs is commonly thrown away as ufelefs, although, if fkilfully managed, it may be made to turn to good account, the ftrongeft acid ftill remaining in it. Mixed with about three times its weight of fine dry fand, and committed to diftillation in a retort, with a well-regulated fire, it yields an exceedingly ftrong empyreumatic acid. Befides, it is, without any rectification, better for fome purpofes, as being ftronger, than the pure acid; particularly for making acetate of potafs or foda: for in the procefs the empyreumatic oil is burnt out.

Diftilled vinegar fhould be colourlefs and tranfparent; have a pungent fmell, and purely acid tafte, totally free from acrimony and empyreuma, and fhould be entirely volatile. It fhould not form a precipitate on the addition of a folution of baryta, or of water faturated with fulphuretted hydrogen; or change its colour when fuper-faturated with ammonia. Thefe circumftances fhew, that it is adulterated with fulphuric acid, or contains lead, copper, or tin.

Diftilled acetous acid, in its effects on the animal economy, does not differ from vinegar, and as it is lefs pleafant to the tafte, it is only ufed for pharmaceutical preparations.

Off. prep.—Acet. potaff. *Ed. Lond. Dub.* Aqua acet. ammon

Ed. Lond. Dub. Acet. plumbi, *Ed. Lond. Dub.* Aqua lith. acetat. *Lond. Dub.*

ACIDUM ACETOSUM FORTE. *Edin.*
Strong Acetous Acid.

Take of
Sulphate of iron dried, one pound;
Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and diftil in a fand bath with a moderate heat, as long as any acid comes over.

ACIDUM ACETOSUM. *Lond.*
Acetous Acid.

Take of
Verdegris, in coarfe powder, two pounds.

Dry it perfectly by means of a water bath faturated with fea-falt; then diftil in a fand bath, and rediftil the liquor obtained.

Its fpecific gravity is to that of diftilled water as 1050 to 1000.

By thefe proceffes, the acid we have before noticed under the title of acetic acid, is prepared. It is now generally believed to differ from diftilled vinegar only in ftrength, and in being perfectly free from all mucilaginous matter; therefore, according to the principles of nomenclature, which gives fimple names to fimple fubftances, the ftrong acid fhould be acetic acid, and our prefent acetous acid fhould be weak or dilute acetic acid.

Many different proceffes have been propofed for preparing acetic acid, but they may be arranged in three claffes. It may be prepared,

1. By decompofing metalline acetates by heat.
2. ———— acetates by fulphuric acid.
3. ———— acetates by fulphates.

The procefs of the London college is an example of the firft kind. But the heat neceffary is fo great, that it decompofes part of the acetic acid itfelf, and gives the product an empyreumatic and unpleafant fmell.

By the fuperior affinity of fulphuric acid, the acid may be eafily expelled from every acetate, whether alkaline or metallic; but part of the fulphuric acid feems to be deprived of its oxygen, and to be converted into fulphurous acid, which renders the product impure.

The proceffes of the laft kind are preferable to the others in many refpects. They are both more economical, and they furnifh a purer acid. Mr. Lowitz directs one part of carefully-dried acetate of foda to be triturated with three parts of fuper-fulphate of potafs, and the diftillation to be conducted in a glafs retort with a gentle heat. The Berlin college mix together twelve ounces of

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ſulphate of potaſs with ſix of ſulphuric acid diluted with eighteen of water, and evaporate to dryneſs. With the ſuper-ſulphate of potaſs thus prepared they decompoſe nine ounces of acetate of ſoda dried with a gentle heat. The proceſs of the Edinburgh college alſo belongs to this claſs, and was firſt propoſed by C. Badollier, apothecary at Chartres.

Medical uſe.—It is almoſt ſolely uſed as an analeptic remedy in ſyncope, aſphyxia, hyſteric affections, and headachs. Applied to the ſkin, it acts as a ſtimulant and rubefacient, but it is moſt frequently ſnuffed up the noſtrils in the ſtate of vapour.

Off. prep.—Acidum acetoſum camph. *Ed.*

ACIDUM BENZOICUM. *Edin.*

Take of

Benzoin, twenty-four ounces;
Carbonate of ſoda, eight ounces;
Water, ſixteen pounds.

Triturate the benzoin with the carbonate, then boil in the water for half an hour, with conſtant agitation, and ſtrain. Repeat the decoction, with other ſix pounds of water and ſtrain. Mix theſe decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,

Diluted ſulphuric acid.

Diſſolve the precipitated benzoic acid in boiling water, ſtrain the boiling ſolution through linen, and ſet it aſide to cryſtallize. Waſh the cryſtals with cold water, dry and preſerve them.

SAL BENZOINI. *Dub.*
Salt of Benzoin.

Take of

Benzoin, in coarſe powder, one pound.

Place it in an earthen pot ſurrounded with ſand, and let the matter which ſublimes, ariſing with a gentle heat, be received in a conical paper capital.

It may be puriſied by ſolution in water, and cryſtallization.

FLORES BENZOES. *Lond.*
Flowers of Benzoin.

Take of

Benzoin, in powder, one pound.

Put it into an earthen pot placed in ſand; and, with a ſlow fire, ſublime the flowers into a paper cone fitted to the pot.

If the flowers be of a yellow colour, mix them with white clay, and ſublime them a ſecond time.

THE diſtinguiſhing character of balſams is their containing benzoic acid. It may be ſeparated from the reſin, which is their

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other principal conftituent, either by fublimation, or by combining it with a falifiable bafe. The London and Dublin colleges direct it to be done in the former way. But even with the greateft care it is almoft impoffible to manage the heat fo as not to decompofe part of the refin, and thus give rife to the formation of an empyreumatic oil, which deftroys the product. Nor can it be freed completely from the empyreumatic oil by the folution and cryftallization prefcribed by the Dublin college, and ftill lefs by the fecond fublimation with clay, directed by that of London.

The other method of feparating benzoic acid from refin, was firft practifed by Scheele, who employed lime-water; Göttling afterwards ufed carbonate of potafs; and, laftly, Gren ufed carbonate of foda, which has been adopted by the Berlin college, and now by that of Edinburgh. Mr. Brandé prefers Scheele's procefs, as the lime diffolves lefs of the refin of the benzoin than the alkalies do. In experiments, which he made for the purpofe of afcertaining the comparative value of the different proceffes, he obtained from one pound of benzoin,

	Oz.	*Dr.*	*Scr.*	*Grs.*
By diftillation, - - - - - - - -	2	0	0	0
— Scheele's procefs, - - - - - -	1	6	2	19
— Gren's and Göttling's procefs - -	1	5	1	10
— boiling benzoin in water, - - - -	1	0	0	10

As the cryftallized acid, on account of its lightnefs and elafticity, is not eafily reduced to powder, for moft purpofes it will be more convenient to keep it in the ftate of a precipitate.

It may alfo be extracted from ftorax, and all the other balfams, particularly thofe of Tolu or Peru; and from the urine of children, and of herbivorous animals.

The benzoic acid has an agreeable tafte, and a fragrant fmell, efpecially when heated. It is foluble in alcohol and in boiling water, but very fparingly in cold water, although it may be fufpended in it, by means of fugar, fo as to form an elegant balfamic fyrup.

Off. prep.—Tinct. opii camph. *Lond. Dub.* Tinct. opii ammon. *Ed.*

OLEUM SUCCINI ET ACIDUM SUCCINI. *Edin.*

Oil of Amber and Succinic Acid.

Take of

Amber reduced to powder, and of pure fand, equal parts.

Mix them, and put them into a glafs retort, of which the mixture may fill one half: then adapt a large receiver, and diftil in a fand bath, with a fire gradually increafed. At firft, a watery liquor will come over, with fome yellow oil; then a yellow oil, with an acid falt; and laftly, a reddifh and black-coloured oil.

Pour the liquor out of the receiver, and ſeparate the oil from the water. Preſs the ſalt collected from the neck of the retort and ſides of the receiver between folds of blotting-paper, to free it from the oil adhering to it; then purify it by ſolution in warm water and cryſtallization.

SAL SUCCINI. *Dub.*
Salt of Amber.

Take of
Amber,
Pure ſand, each one pound.

Diſtil, with a heat gradually increaſed, an acid liquor, an oil, and a ſalt diſcoloured with oil. Let the ſalt be diſſolved in boiling water, and cryſtals formed by ſlow cooling.

SAL ET OLEUM SUCCINI. *Lond.*
Salt and Oil of Amber.

Take of
Amber, two pounds.

Diſtil in a ſand heat gradually augmented; an acid liquor, oil, and ſalt loaded with oil, will aſcend.

SAL SUCCINI PURIFICATUS. *Lond.*
Purified Salt of Amber.

Take of
Salt of amber, half a pound;
Diſtilled water, one pint.

Boil the ſalt in diſtilled water, and ſet aſide the ſolution to cryſtallize.

WE are not acquainted with any experiments which determine whether the ſuccinic acid exiſts as ſuch in the amber, or whether it be a product of the decompoſition of the amber by the action of heat, for in the proceſs employed for obtaining ſuccinic acid the amber is completely decompoſed.

The ſand is added by the Dublin college to prevent the amber from running together into maſſes, and impeding the diſtillation; but as it renders the reſiduum unfit for the uſe of the varniſher, it is not adviſable. According to Göttling, this diſtillation ſhould be performed in a tubulated iron or earthen-ware retort, expoſed to the immediate action of the fire; for he ſays, that, in a ſand bath we cannot regulate the heat ſufficiently, and that a glaſs retort is incapable of ſupporting the neceſſary temperature.

Beſides the ſuccinic acid collected from the neck of the retort, and ſides of the receiver, the oil waſhes down a portion of it into the receiver, and the watery liquor which comes over is ſaturated with it. But the whole of it may be obtained by agitating the oil with ſome boiling water, which will diſſolve the acid. This ſo-

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lution is then to be added to the acid liquor, and the acid they contain is eafily obtained by evaporation and cryftallization. The acid may afterwards be purified by folution in boiling water and cryftallization, according to the directions of the colleges.

But even after repeated folutions and cryftallizations, a portion of empyreumatic oil ftill adheres to the acid, and renders it impure. Other methods of purifying it have been therefore attempted. Demachy faturated it with lime, feparated the lime by fulphuric acid, and fublimed the fuccinic acid: Richter faturated fuccinic acid with potafs, decompofed the falt formed with acetate of lead, and difengaged the fuccinic acid from the lead by means of diluted fulphuric acid: laftly, Morveau afferts that he obtained it in a ftate of perfect purity, by treating it with nitrous acid. It is often adulterated with muriate of ammonia, fulphuric acid, fulphate of potafs, fugar, &c. When pure it is entirely volatile, gives out no ammoniacal fumes when triturated with potafs, is not precipitated by folutions of baryta, and is foluble in alcohol.

Succinic acid, although retained in our pharmacopœias, is never ufed in medicine.

AQUA AËRIS FIXI. *Dub.*
Water Impregnated with Fixed Air.

Take of

White marble in powder, three ounces;

Diluted fulphuric acid, mixed with an equal quantity of water, a pound and a half.

Mix them gradually in a Nooth's apparatus, and let the air evolved pafs through fix pounds of pure fpring water, placed in the upper part of the apparatus; and let agitation be occafionally employed until the water fhall have acquired a fub-acid tafte.

Carbonic acid may be feparated from carbonate of lime.

a. By the action of heat alone.

b. By an acid having a fuperior affinity for the lime.

In the former way the carbonic acid is perfectly pure, in the latter it carries over a little of the ftronger acid, which gives a flight degree of pungency.

In this procefs the carbonic acid is feparated from the carbonate of lime by the fuperior affinity of fulphuric acid. As it is difengaged, it affumes a gafeous form, and would be diffipated in the atmofphere, if it were not made to pafs through water, which, at a medium temperature, is capable of abforbing about an equal bulk of this gas, and, by the affiftance of preffure, a much greater proportion.

Various contrivances have been made for this purpofe. Of thefe the moft eafily managed, and moft convenient for general ufe, is

the apparatus of Nooth; and, for larger quantities, that of Woulfe, or fome modification of it. By the proper application of preffure, M. Paul, of Geneva, now of London, is able to impregnate water with no lefs than fix times its bulk of carbonic acid gas.

Med. ufe.—Water impregnated with carbonic acid, fparkles in the glafs, has a pleafant tafte, and forms an excellent, delicious beverage. It diminifhes thirft, leffens the morbid heat of the body, and acts as a powerful diuretic. It is alfo an excellent remedy in increafed irritability of the ftomach, as in advanced pregnancy; and it is one of the beft anti-emetics which we poffefs.

CHAP. III.

ALKALIES.

AQUA POTASSÆ; vulgo, LIXIVIUM CAUSTICUM. *Edin.*
Water of Potafs, commonly called *Cauftic Ley.*

Take of
Newly prepared lime, eight ounces;
Carbonate of potafs, fix ounces.

Put the lime into an iron or earthen veffel, with twenty-eight ounces of warm water. After the ebullition is finifhed, inftantly add the falt; and having thoroughly mixed them, cover the veffel till they cool. When the mixture has cooled, agitate it well, and pour it into a glafs funnel, whofe throat muft be obftructed with a piece of clean linen. Cover the upper orifice of the funnel, and infert its tube into another glafs veffel, fo that the water of potafs may gradually drop through the rag into the lower veffel. As foon as it ceafes to drop, pour into the funnel fome ounces of water; but cautioufly, fo that it may fwim above the matter. The water of potafs will again begin to drop, and the affufion of water is to be repeated in the fame manner, until three pounds have dropped, which will happen in the fpace of two or three days; then mix the fuperior and inferior parts of the liquor together by agitation, and keep it in a well-ftopt phial.

AQUA KALI PURI. *Lond.*
Water of Pure Kali.

Take of
Prepared kali, four pounds;
Lime, fix pounds;
Diftilled water, four gallons.

Put four pints of water to the lime, and let them ſtand together for an hour; after which, add the kali and the reſt of the water; then boil for a quarter of an hour; ſuffer the liquor to cool, and ſtrain it. A pint of this liquor ought to weigh ſixteen ounces.

If the liquor efferveſce with any acid, add more lime, and boil the liquor and lime in a covered veſſel for five minutes. Laſtly, let it cool again, and ſtrain it.

Lixivium Causticum. *Dub.*
Cauſtic Ley.

Take of
Freſh burnt lime, eight ounces;
Mild vegetable alkali, ſix ounces.

Put the lime into an earthen veſſel, and pour upon it thirty ounces of hot water. With the ſlaked lime immediately mix the ſalt, and cover the veſſel. Pour the mixture, as ſoon as it is cooled, into a glaſs funnel, whoſe throat is obſtructed with bits of ſtone covered with ſand. Having covered the funnel, let the ley drop into a veſſel placed to receive it; water being from time to time poured into the funnel, until three pounds have paſſed through. Let the liquor be agitated, and kept in a glaſs veſſel well cloſed.

If the ley be rightly prepared, it will have neither colour nor ſmell, and will not efferveſce when mixed with acids.

The ſpecific gravity of this liquor is to that of diſtilled water as 1090 to 1000.

These proceſſes do not differ materially. They are founded upon the affinity of lime being ſtronger than that of potaſs for carbonic acid. Of courſe, when lime comes in contact with carbonate of potaſs, the carbonic acid quits the potaſs to unite with the lime, and the reſults of the mixture are potaſs and carbonate of lime. Now, as the carbonate of lime is inſoluble in water, and the potaſs is very ſoluble, they may be ſeparated by filtration. n doing this, however, we muſt take care to employ inſtruments on which the ſolution of potaſs does not act, and to prevent the ree acceſs of air, from which it would attract carbonic acid, and thus fruſtrate the whole operation. The latter object is attained by covering the upper or broad end of the funnel with a plate of glaſs, and inſerting the lower end into the neck of a phial, which t fits pretty cloſely. The former object is attended with greater difficulties, and indeed ſcarcely to be effected, ſo powerful and general is the agency of potaſs. All animal ſubſtances are immediately attacked and deſtroyed by it; therefore, our filters cannot be made of ſilk, woollen, or paper which contains glue; and

although neither vegetable matters nor ſilica entirely eſcape its action, linen and ſand are, on the whole, the leaſt objectionable. A filter of ſand was uſed by Dr. Black. He firſt dropt a rugged pebble into the tube of the funnel, in ſome part of which it formed itſelf a firm bed, while the inequalities on its ſurface afforded interſtices of ſufficient ſize for the paſſage of the filtering liquor. On the upper ſurface of this ſtone he put a thin layer of lint or clean tow; immediately above this, but not in contact with it, he dropped a ſtone ſimilar to the former, and of a ſize proportioned to the ſwell in the upper part of the tube of the funnel. The interſtices between this ſecond ſtone and the funnel were filled up with ſtones of a leſs dimenſion, and the gradation uniformly continued till pretty ſmall ſand was employed. Finally, this was covered with a layer of coarſer ſand, and ſmall ſtones, to ſuſtain the weight of the fluid. A filter of ſand being thus conſtructed in the funnel, it was waſhed perfectly clean by making clean water paſs through it, till it dropt from the lower extremity of the funnel perfectly clear and tranſparent; and before uſing it, it was allowed to ſtand for ſome days, that no water might remain among the interſtices of the ſand.

From the ſpongy nature of the reſiduum which remains upon the filter, and eſpecially if we uſe that of ſand, a conſiderable quantity of the ſolution of potaſs will be retained. It is, however, eaſily obtained, by pouring gently over it, ſo as to diſturb it as little as poſſible, a quantity of water; the ley immediately begins again to drop from the funnel, and as, from the difference of their ſpecific gravity, the water does not mix with it, but ſwims above it, the whole ley paſſes through before any of the water. By means of the taſte, we eaſily learn when the whole ley has paſſed.

As it is natural to ſuppoſe that the ſtrongeſt ſolution will paſs firſt, and the weakeſt laſt, we are directed to agitate the whole together, to render their ſtrength uniform.

If the ſolution of potaſs be pure, it will be colourleſs, and it will neither effervesce with acids, nor form a precipitate with carbonate of potaſs. If it effervesces, carbonic acid is preſent, and muſt be ſeparated by again boiling the ſolution with a little lime, or by dropping into it lime-water, as long as it produces any precipitate. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be ſeparated by dropping into the ley a ſolution of the carbonate of potaſs. When we have thus purified our ſolution of potaſs, it muſt be again filtered.

Med. uſe.—The ſolution of cauſtic potaſs, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into diſuſe. The very contradictory accounts of its effects as a ſolvent are now in ſome degree explicable, ſince it has been diſcovered that urinary calculi are very different in

their natures, ſo that ſome of them are only ſoluble in acids, and others only in alkalies. Of the laſt deſcription are the calculi of uric acid, which are very frequent, and thoſe of urate of ammonia. On theſe, therefore, alkalies may be ſuppoſed to make ſome impreſſion; and that alkalies, or alkaline carbonates, taken by the mouth, have occaſionally relieved calculous complaints, is certain. It is, however, ſaid that their continued uſe debilitates the ſtomach; and M. Fourcroy has propoſed applying the remedy immediately to the diſeaſe, by injecting into the bladder a tepid ſolution of potaſs or ſoda, ſo dilute that it can be held in the mouth. Before the alkaline ſolution be injected, the bladder is to be completely evacuated of urine, and waſhed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated, and allowed to ſettle. If, on the addition of a little muriatic acid, a precipitate be formed, we ſhall have reaſon to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline ſolutions may alſo be taken into the ſtomach as antacids, but we poſſeſs others which are preferable.

Externally, alkaline ſolutions have been more frequently uſed, either very dilute, ſimply as a ſtimulus, in rickets, gouty ſwellings, gonorrhœa, and ſpaſmodic diſeaſes, or concentrated as a cauſtic to deſtroy the poiſon of the viper, and of rabid animals.

Off. prep.—Sulphuret ant. præcip. *Edin. Lond. Dub.*

POTASSA; olim, CAUSTICUM COMMUNE ACCERRIMUM. *Ed.*
Potaſs; formerly, Strongeſt common Cauſtic.

Take of

The ſolution of potaſs, any quantity.

Evaporate it in a covered very clean iron veſſel, till, on the ebullition ceaſing, the ſaline matter flows gently like oil, which happens before the veſſel becomes red. Then pour it out on a ſmooth iron plate; let it be divided into ſmall pieces before it hardens, and immediately depoſited in a well-ſtopt phial.

KALI PURUM. *Lond.*
Pure Kali.

Take of

Water of pure kali, one gallon.

Evaporate it to dryneſs; after which let the ſalt melt on the fire, and pour it out.

ALKALI VEGETABILE CAUSTICUM. *Dub.*
Cauſtic Vegetable Alkali.

Take of

Cauſtic ley, any quantity.

Evaporate it over the fire in a very clean iron veſſel, until the ebullition having ceaſed, the ſaline matters, on increaſing the

heat, remain almoſt at reſt. Let the liquified ſalt be poured out upon an iron plate, and while it is congealing, be cut into proper pieces, which are immediately to be ſhut up in very cloſe veſſels.

The principal thing to be attended to in this operation, is to conduct the evaporation ſo rapidly that the ley ſhall not abſorb any carbonic acid from the atmoſphere. As long as any water of ſolution remains, the ebullition is evident, and the evaporation is to be continued until it ceaſe. The heat is then to be increaſed a little, which renders the potaſs perfectly fluid, and gives it the appearance of an oil, when it is ready to be poured out, either on a ſlab, as directed by the colleges, or into iron moulds, ſuch as are uſed for the melted nitrate of ſilver.

The potaſs prepared according to theſe directions is ſufficiently pure for medical uſe, but is not fit for chemical experiments. We can however obtain it perfectly white and cryſtallized, according to Berthollet, by adding to the ley, when evaporated ſo far that it would aſſume the conſiſtence of honey, if permitted to cool, a quantity of alcohol equal to one third of the carbonate of potaſs operated on, mixing them together, and letting them boil a minute or two. The mixture is then to be poured into a glaſs veſſel, and corked up, when the impurities will gradually ſubſide, partly in a ſolid form, and partly diſſolved in water. The ſuper-natant alcoholic ſolution is then to be evaporated rapidly, till its ſurface become covered with a black cruſt, which is to be removed, and the liquid below is to be poured into a porcelain veſſel, when it will concrete into a white ſubſtance, which is to be broken in pieces, and immediately excluded from the action of the air.

A leſs expenſive way of obtaining potaſs perfectly pure is that of Lowitz. Evaporate a ſolution of potaſs till a thick pellicle form on its ſurface; allow it to cool; ſeparate all the cryſtals formed, as they conſiſt of foreign ſalts: renew the evaporation in an iron or ſilver baſon; and remove the pellicles which form on the ſurface with an iron ſkimmer, as long as any appear. When the ebullition ceaſes, remove the veſſel from the fire, and agitate the fuſed ſalt with an iron ſpatula while it cools. Diſſolve the ſaline maſs in twice its weight of water, and evaporate in a ſilver baſon till it begins to cryſtallize. The cryſtals are pure potaſs. The fluid which ſwims over them has a dark-brown colour, and muſt be poured off: but if kept in a cloſe-ſtopt phial, it will depoſit its colouring matter, and by evaportion will furniſh more cryſtals of potaſs.

Med. uſe.—Potaſs is only uſed as a cauſtic, or to form ſolutions of a known ſtrength; and even its uſe as a cauſtic is inconvenient, from its being ſo quickly affected by the air, and from its rapid deliqueſcence, which renders it apt to ſpread.

Off. prep.—Alk. veget. ſulph. *Dub.* Alcohol, *Lond. Dub.* Æth. ſulph. *Ed. Lond. Dub.*

POTASSA CUM CALCE; olim, CAUSTICUM COMMUNE MITIUS. *Edin.*

Potaſs with Lime, formerly *Milder common Cauſtic.*

Take of

Solution of potaſs, any quantity.

Evaporate in a covered iron veſſel till one third remains; then mix with it as much new-ſlaked lime as will bring it to the confiſtence of pretty ſolid pap, which is to be kept in a veſſel cloſely ſtopt.

CALX CUM KALI PURO. *Lond.*

Lime with Pure Kali.

Take of

Quicklime, five pounds and four ounces;

Water of pure kali, ſixteen pounds.

Boil away the water of pure kali to a fourth part; then ſprinkle in the lime, reduced to powder by the affuſion of water. Keep it in a veſſel cloſely ſtopped.

CAUSTICUM MITIUS. *Dub.*

Milder Cauſtic.

Evaporate cauſtic ley to one third, then add powdered lime till it become thick, and form it into proper maſſes.

THE addition of the lime in theſe preparations renders them leſs apt to deliqueſce, more eaſily managed, and milder in their operation.

CARBONAS POTASSÆ. *Edin.*

Carbonate of Potaſs.

Let impure carbonate of potaſs, called in Engliſh *pearl aſhes,* be put into a crucible, and brought to a low red heat, that the oily impurities, if there be any, may be burnt out: then triturate it with an equal weight of water, and mix them thoroughly by agitation. After the feces have ſubſided, pour the liquor into a very clean iron pot, and boil to dryneſs, ſtirring the ſalt towards the end of the proceſs, to prevent its ſticking to the veſſel.

KALI PRÆPARATUM. *Lond.*

Prepared Kali.

Take of

Potaſhes, two pounds.

Boiling diſtilled water, three pints.

Diſſolve and filter through paper; evaporate the liquor till a pellicle appears on the ſurface; then ſet it aſide for twelve hours, that the neutral ſalts may cryſtallize: after which, pour out the liquor, and boil away, with a ſlow fire, the whole of the water, conſtantly ſtirring, leſt the ſalt ſhould adhere to the pot.

In like manner is purified impure kali from the aſhes of any kind of vegetable.

The ſame ſalt may be prepared from tartar, which ſhould be burnt till it becomes of an aſh colour.

ALKALI VEGETABILE MITE. *Dub.*
Mild Vegetable Alkali.

Take of
Potaſhes,
Boiling water, each ſix pounds.

Mix them by agitation in a glaſs veſſel, and digeſt them for three days. Then pour off the pure liquor, and evaporate it to dryneſs in a very clean iron veſſel. Towards the end of the operation, ſtir the ſaline maſs conſtantly with an iron ſpatula. Then ſeparate, by means of a ſieve, the finer particles, which are to be kept in a glaſs veſſel well ſtopped.

CARBONAS POTASSÆ PURISSIMUS; olim, SAL TARTARI. *Edin.*
Pure Carbonate of Potaſs; formerly *Salt of Tartar*.

Take of
Impure ſuper-tartrate of potaſs, any quantity.

Wrap it up in moiſt bibulous paper, or put into a crucible, and burn it to a black maſs, by placing it among live coals. Having reduced this maſs to powder, expoſe it in an open crucible to the action of a moderate fire, till it become white, or at leaſt of an aſh-grey colour, taking care that it do not melt. Then diſſolve it in warm water; ſtrain the liquor through a linen cloth, and evaporate it in a clean iron veſſel, diligently ſtirring it towards the end of the proceſs with an iron ſpatula, to prevent it from ſticking to the bottom of the veſſel. A very white ſalt will remain, which is to be left a little longer on the fire till the bottom of the veſſel becomes almoſt red. Laſtly, when the ſalt is grown cold, keep it in glaſs veſſels well ſtopt.

THE potaſh of commerce we have already ſhewn to contain a conſiderable proportion of foreign ſalts. By the proceſs directed by the colleges, it is purified from thoſe which are cryſtallizable; and although it ſtill contains muriate of potaſs and ſilica, it is ſufficiently pure for the purpoſes of medicine.

The pureſt carbonate of potaſs in common uſe is that obtained by incinerating the impure ſuper-tartrate of potaſs, as all the ſubſtances it contains, except the potaſs, are decompoſed by the heat The tartaric acid and colouring matter are deſtroyed, and part of the carbonic acid, which is formed, unites with the potaſs.

But this ſalt, in whatever way obtained, is not ſtrictly entitled to the appellation of carbonate; for it is not ſaturated with the acid, or rather it is a mixture of carbonate of potaſs and potaſs, in variable proportions. It is owing to the uncombined potaſs that it is ſtill deliqueſcent, and in ſome degree cauſtic. It may be eaſily ſaturated, however, with carbonic acid, by expoſing it in ſolution to the contact of the air for a conſiderable time, or by making a ſtream of carbonic acid gas paſs through a ſolution of it, or by diſtilling it with carbonate of ammonia. M. Curadau has propoſed a cheaper mode of ſaturating potaſs with carbonic acid. He diſſolves the potaſs in a ſufficient quantity of boiling water, mixes it with as much dried tanner's bark as to make it pretty dry, and then expoſes the mixture in a covered crucible to the heat of a reverberatory furnace for half an hour. By lixiviation and cryſtallization, the mixture affords beautiful cryſtals of carbonate of potaſs. In this ſtate it is cryſtallizable, and its cryſtals are permanent. It conſiſts of about 43 acid, 40 potaſs, and 17 water. The ſaturation with carbonic acid is one of the beſt means of purifying it; for it always ſeparates ſilica from the uncombined alkali.

Med. uſe.—Carbonate of potaſs is frequently employed in medicine, in conjunction with other articles, particularly for the formation of ſaline neutral draughts and mixtures: but it is uſed alſo by itſelf in doſes from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution.

Off. prep.—Aqua potaſſæ, *Lond. Ed. Dub.* Aqua ſuper-carbonatis potaſſæ, *Ed. Dub.* Acetis potaſſ. *Ed. Lond. Dub.* Sulphas potaſſæ, *Ed.* Sulphur pot. *Ed. Lond.* Tartris pot. *Ed. Lond. Dub.* Sulph. ſtib. fuſcum, *Dub.* Calx ſtibii, præcip. *Dub.* Alcohol, *Lond. Dub.*

AQUA KALI PRÆPARATI. *Lond.*
Water of Prepared Kali.

Take of

Prepared kali, one pound.

Set it in a moiſt place till it deliqueſce, and then ſtrain it.

Lixivium Mite. *Dub.*
Mild Ley.

Take of

Mild vegetable alkali, one pound.

Diſſolve it in one pound of water.

The laſt of theſe preparations is a ſolution of the mixed or ſubcarbonate of potaſs, in a fixed proportion of water; and the former is a ſolution of carbonate of potaſs, in a variable quantity of water. The Dublin ſolution contains the ſilica, and all the other impurities of the carbonate employed, while, according to

the London procefs, the uncombined portion of the potafs, at the fame time that it deliquefces, becomes faturated with carbonic acid, and depofites the filica. It would, therefore, be a very confiderable improvement of this preparation, to diffolve cryftallized carbonate of potafs in a determined proportion of water.

Off. prep.—Calx hydrarg. alb. *Lond.*

AQUA SUPER-CARBONATIS POTASSÆ. *Ed.*

Solution of Super-carbonate of Potafs.

Take of

Water, ten pounds;

Pure carbonate of potafs, one ounce.

Diffolve and expofe the folution to a ftream of carbonic acid, arifing from

Carbonate of lime in powder,

Sulphuric acid, each three ounces;

Water, three pounds, gradually and cautioufly mixed.

The chemical apparatus invented by Dr. Nooth is well adapted for this preparation. But if a larger quantity of the liquor be required, the aparatus of Dr. Woulfe is preferable.

LIQUOR ALKALI VEGETABILIS MITISSIMI. *Dub.*

Solution of Mildeft Vegetable Alkali.

Take of

Mild vegetable alkali, an ounce and a half;

Water, fix pounds.

Mix them, and tranfmit fixed air through the liquor, according to the formula for preparing fixed air (p. 416), except that a double quantity of marble and acid muft be employed to faturate the folution.

The colder the air is, and the greater the preffure, the better is the liquor, which fhould be kept in well-clofed veffels.

As foon as the preparation is finifhed, the liquor fhould be drawn off into pint bottles, which are to be well corked, and kept in a cool fituation, with the head down, or laid on one fide. It fhould be perfectly tranfparent, and have an acidulous, not at all alkaline tafte; and when poured out of the bottles, it fhould have a fparkling appearance.

Medical ufe.—In this folution, carbonate of potafs is combined with excefs of carbonic acid, by which means it is better adapted for internal ufe, as it is rendered not only more pleafant to the tafte, but is lefs apt to offend the ftomach. Indeed it is the only form in which we can exhibit potafs in fufficient dofes, and for a fufficient length of time, to derive much benefit from its ufe in calculous complaints. It has certainly been frequently of advantage in thefe affections, but probably only in thofe inftances in which the ftone confifts of uric acid, or urate of ammonia: for although fuperfaturated with carbonic acid, yet the affinity of that acid for potafs is fo weak, that it really operates as an alkali.

Six or eight ounces may be taken two or three times a-day. It in general proves powerfully diuretic, and ſometimes produces inebriation. This laſt effect is aſcribed to the carbonic acid.

ACETIS POTASSÆ. *Ed.*

Acetite of Potaſs.

Take of

Pure carbonate of potaſs, one pound.

Boil it with a very gentle heat, in four or five times its weight of diſtilled acetous acid, and add more acid at different times, till, on the watery part of the preceding quantity being nearly diſſipated by evaporation, the new addition of acid ceaſes to raiſe any efferveſcence, which will happen, when about twenty pounds of acid have been conſumed. It is then to be ſlowly dried. The impure ſalt remaining, is to be melted with a gentle heat, for a ſhort time, and afterwards diſſolved in water, and filtered through paper. If the liquefaction has been properly performed, the filtered liquor will be limpid; but if otherwiſe, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very ſhallow glaſs veſſel, occaſionally ſtirring the ſalt as it becomes dry, that its moiſture may be ſooner diſſipated. Laſtly, the acetite of potaſs ought to be kept in a veſſel very cloſely ſtopt, to prevent it from deliqueſcing.

KALI ACETATUM. *Lond.*

Acetated Kali.

Take of

Prepared kali, one pound.

Boil it, with a ſlow fire, in four or five times its quantity of diſtilled vinegar; and when the efferveſcence ceaſes, add, at different times, more diſtilled vinegar, until one portion of vinegar being nearly evaporated, the addition of another will excite no efferveſcence, which will happen when about twenty pounds of diſtilled vinegar are conſumed; afterwards let it be dried ſlowly. An impure ſalt will be left, which is to be melted for a little while with a ſlow fire; then diſſolved in water, and filtered through paper.

If the fuſion has been rightly performed, the ſtrained liquor will be colourleſs; if otherwiſe, of a brown colour.

Laſtly, evaporate this liquor with a ſlow fire, in a very ſhallow glaſs veſſel; frequently ſtirring the maſs, that the ſalt may be more completely dried, which ſhould be kept in a veſſel cloſely ſtopt.

The ſalt ought to be very white, and diſſolve wholly, both in water and ſpirit of wine, without leaving any feces. If the ſalt, although white, ſhould depoſit any feces in ſpirit of wine, the ſolution ſhould be filtered through paper, and the ſalt again dried.

ALKALI VEGETABILI ACETATUM; olim, SAL DIURETICUS. *Dub.*

Acetated Vegetable Alkali, formerly *Diuretic Salt.*

Take of

Mild vegetable alkali, any quantity.

Add to it at different times, about five times its weight of distilled vinegar, at a moderate temperature. When the evaporation ceases, and the liquor is somewhat evaporated, add, at intervals, distilled vinegar, until the mixture shall entirely cease to effervesce. Then evaporate to dryness; and having increased the fire a little, bring the saline mass into a state of fusion. Dissolve the salt, after it has cooled, in water: filter the solution, and evaporate, until, on cooling, it shall concrete into a crystalline mass, which should be very white. Put this, while still warm, into vessels accurately closed.

THIS is both a troublesome and expensive preparation, for when attempted to be made by simply evaporating to dryness, the salt has always a dark, unpleasant colour, which can neither be removed by repeated solution and crystallization, nor even by solution in alcohol. It is doubtful to what the colour is owing. It has been ascribed by some to part of the acetic acid being decomposed by heat during the exsiccation of the salt: they accordingly recommend the evaporation to be conducted very gently, and the pellicles to be skimmed from the surface of the liquor as fast as they are formed; and in this way, they say, they have procured at once a very white salt. Others ascribe it to some foreign matter which rises in distillation with the last portions of the acetous acid, and therefore direct, that only the first portions which come over should be used, or that the acetous acid should be distilled with charcoal: while others again ascribe it to accidental impurities contracted during the operation, and recommend the utmost attention to cleanliness, and the use of earthen vessels. To whatever cause it may be owing, and the second appears to us the most probable, the colour is most effectually destroyed by fusing the salt. The heat necessary to do this decomposes the colouring matter; and on dissolving the fused mass in water, and filtering the solution, we find a fine light charcoal on the filter. But this fusion is attended with considerable loss, for part of the acetic acid itself is decomposed.

The operator must be particularly careful, in melting it, not to use a greater heat, nor to keep it longer liquified, than what is absolutely necessary: a little should be occasionally taken out, and put into water; and as soon as it begins to part freely with its black colour, the whole is to be removed from the fire.

The exsiccation of the solution of the salt, after it has been fused, must be conducted very carefully, as it is exceedingly apt to be decomposed, which would render a new solution and ex-

ficcation neceffary. The teft of its purity, by diffolving it in alcohol, as directed by the London college, is to difcover if any of the acetous acid itfelf has been decompofed in the operation; for the carbonate of potafs, which is in that cafe formed, is infoluble in alcohol.

To fpare trouble and expence, attempts have been made to prepare acetate of potafs with undiftilled vinegar, and even with the refiduum of the diftillation of acetic acid: and they have been to a certain degree fuccefsful: but as repeated fufion and cryftallization are neceffary to bring the falt to a fufficient degree of purity, it does not appear that they were more economical. But if to acetate of potafs prepared with impure vinegar, we add a fufficient quantity of fulphuric acid, by diftillation we obtain an acetic acid of great ftrength, which forms a beautiful acetate of potafs without fufion. Laftly, this falt may be prepared by the decompofition of acetates; for example, of the acetate of lime by tartrate of potafs.

Acetate of potafs has a fharp, fomewhat pungent tafte. It is foluble at 60°, in about its own weight of water. It is alfo foluble in alcohol. It is deliquefcent. It is decompofed by the ftronger acids; by a decoction of tamarinds; by the fulphate of foda and magnefia; by muriate of ammonia; by the tartrate of foda and potafs; and by fome metalline falts. Its acid is deftroyed by a high temperature.

Medical ufe.—Acetate of potafs, which way foever prepared, provided it be properly made, is a medicine of great efficacy, and may be fo dofed and managed as to prove either mildly cathartic, or powerfully diuretic; few of the faline deobftruents equal it in virtue. The dofe is from half a fcruple to a drachm or two. A fimple folution, however, of alkaline falt in vinegar, without exficcation, is perhaps not inferior as a medicine to the more expenfive falt. Two drachms of the alkali, faturated with vinegar, have been known to occafion, in hydropic cafes, ten or twelve ftools, and a plentiful difcharge of urine, without any inconvenience.

Off. prep.—Tinctura ferri acetati. *Dub.* Acetis hydrarg. *Ed. Lond. Dub.*

NITRUM PURIFICATUM. *Lond.*
Purified Nitre.

Take of
Nitre, two pounds;
Diftilled water, four pints.

Boil the nitre in the water, till it be diffolved; ftrain the folution, and fet it afide to cryftallize.

Common nitre contains ufually a confiderable portion of muriate of foda, which in this procefs is feparated, for it remains diffolved after the greateft part of the nitrate of potafs has cryftallized. The

cryſtals which ſhoot after the firſt evaporation are large, regular, and pure: but when the remaining liquor is further evaporated, and this repeated a ſecond or third time, the cryſtals prove at length ſmall, imperfect, and tipt with little cubical cryſtals of muriate of ſoda. When pure, their ſolution is not affected by nitrate of ſilver, or nitrate of baryta.

SULPHAS POTASSÆ; olim, TARTARUM VITRIOLATUM. *Edin.*

Sulphate of Potaſs, formerly *Vitriolated Tartar.*

Take of

Sulphuric acid, diluted with ſix times its weight of water, any quantity.

Put it into a capacious glaſs veſſel, and gradually drop into it, of pure carbonate of potaſs, diſſolved in ſix times its weight of water, as much as is ſufficient thoroughly to neutralize the acid. The effervеſcence being finiſhed, ſtrain the liquor through paper; and after evaporation, ſet it aſide to cryſtallize.

Sulphate of potaſs may be alſo conveniently prepared from the reſiduum of the diſtillation of nitrous acid, by diſſolving it in warm water, and ſaturating it with carbonate of potaſs.

KALI VITRIOLATUM. *Lond.*

Vitriolated Kali.

Take of

The ſalt which remains after the diſtillation of the nitrous acid, two pounds;

Diſtilled water, two gallons.

Burn out the ſuperfluous acid with a ſtrong fire, in an open veſſel: then boil it a little while in the water; ſtrain, and ſet the liquor aſide to cryſtallize.

ALKALI VEGETABILE VITRIOLATUM. *Dub.*

Vitriolated Vegetable Alkali.

Let the ſalt which remains after the diſtillation of nitrous acid reduced to powder, be diſſolved in a ſufficient quantity of boiling water. Let the filtered liquor be evaporated with a very gentle heat, that it may cryſtallize.

THIS ſalt is very ſeldom prepared on purpoſe, as it may be obtained from the reſiduum of many other preparations, by ſimple ſolution and cryſtallization. For ſo ſtrong is the affinity between ſulphuric acid and potaſs, that they ſcarcely ever meet without combining to form this ſalt. All the ſulphates, except that of baryta are decompoſed by potaſs and moſt of its combinations; and reciprocally, all the compounds of potaſs are decompoſed by ſulphuric acid and moſt of its combinations; and in all theſe decompoſitions, ſulphate of potaſs is one of the products.

The greateſt part of the ſulphate of potaſs of commerce is obtained from the reſiduum of the diſtillation of ſulphate of iron with nitrate of potaſs, by lixiviating it, ſuperſaturating the ſolution with carbonate of potaſs, filtering it boiling hot, and allowing it to cryſtallize. The liquor remaining after the precipiation of magneſia, is alſo a ſolution of ſulphate of potaſs. It is alſo got in conſiderable quantities from the reſiduum remaining in the retort, after the diſtillation of nitrous acid; and all the colleges have given directions for obtaining it in this way. This reſiduum generally contains an exceſs of acid, which converts part of the ſulphate into ſuper-ſulphate of potaſs. The Dublin college allow this part to be loſt. The London drive off the exceſs of acid by intenſe heat, and thus get the whole of the ſulphate; but at the ſame time convert it into a very difficultly ſoluble maſs. While the Edinburgh college, more ſcientifically economical than either, derive advantage from the exceſs of acid, by ſimply ſaturating it with carbonate of potaſs.

As the reſiduum of the diſtillation of nitrous acid may not always be at hand, the Edinburgh college alſo give a receipt for making this ſalt, by directly combining its conſtituents. It would have been more economical to have uſed a ſolution of ſulphate of iron, in place of ſulphuric acid, by which means not only an equally pure ſulphate of potaſs would have been procured at leſs expence, but alſo a very pure carbonate of iron.

Sulphate of potaſs forms ſmall tranſparent very hard cryſtals, generally aggregated in cruſts and permanent in the air. It has a bitter taſte, is ſlowly ſoluble in water, requiring 16 parts at 60°, and 4 at 212°. It is not ſoluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat. It conſiſts of 45.2 acid, and 54.8 potaſs. It is decompoſed by the barytic ſalts; by the nitrates and muriates of lime and of ſtrontia, by the tartrates partially; and by the ſalts of mercury, ſilver and lead.

Medical uſe.—Sulphate of potaſs, in ſmall doſes, as a ſcruple or half a drachm, is an uſeful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not paſs off ſo haſtily as the ſulphate of ſoda, and ſeems to extend its action further.

Off. prep.—Pulv. ipec. et opii. *Ed. Lond. Dub.* Pulv. ſcam. comp. *Lond.*

SULPHAS POTASSÆ CUM SULPHURE; olim SAL POLYCHRESTUS. *Ed.*

Sulphate of Potaſs with Sulphur, formerly *Sal Polychreſt.*

Take

Nitrate of potaſs in powder,
Sublimed ſulphur, of each equal parts.

Mingle them well together, and inject the mixture, by little and little at a time, into a red-hot crucible: the deflagration being over, let the falt cool, after which it is to be put up in a glafs veffel well ftopped.

In this procefs the nitric acid of the nitrate of potafs is decompofed by the fulphur, which is in part acidified. But the quantity of oxygen contained in the nitric acid, is not always fufficient to acidify the whole fulphur employed; therefore part of it remains in the ftate of fulphureous acid, which is probably chemically combined with part of the potafs in the ftate of fulphite, for the whole faline mafs formed, is more foluble in water than fulphate of potafs. It is cryftallizable, and by expofure to the air, gradually attracts oxygen, and is converted into fulphate of potafs. In fome experiments which I made to determine the ftate in which the fulphur exifted in this falt, carefully prepared, it feemed to be fulphuric acid; for it neither gave out a fulphureous fmell on the addition of fulphuric acid, nor was a folution of it precipitated by acids. In its medical effects and exhibition, it agrees with fulphate of potafs.

Off. prep.—Pil aloes cum colocynth.

SULPHURETUM POTASSÆ; olim, HEPAR SULPHURIS. *Edin.*

Sulphuret of Potafs, formerly *Liver of Sulphur.*

Take of

Carbonate of potafs.

Sublimed fulphur, each eight ounces.

Grind them well together, put them into a large coated crucible; fit a cover to it, and having applied live coals cautioufly around it, bring them at length to a ftate of fufion.

Break the crucible as foon as it has grown cold, take out the fulphuret, and keep it in a well-clofed phial.

KALI SULPHURATUM. *Lond*

Sulphuretted Kali.

Take of

Flowers of fulphur, one ounce;

Prepared kali, five ounces.

With the fulphur melted with a gentle fire, mix the falt by conftant agitation until they unite.

ALKALI VEGETABILE SULPHURATUM. *Dub.*

Sulphuretted Vegetable Alkali.

Take of

Cauftic vegetable alkali in powder.

Sublimed fulphur, each two ounces.

To the ſulphur, melted by a gentle heat, add the alkali; covering the veſſel, if the mixture ſhall take fire.

THERE exiſts a very ſtrong affinity between ſulphur and potaſs, but they muſt be united in a ſtate of perfect dryneſs; becauſe, if any moiſture be preſent, it is decompoſed, and alters the nature of the product. If potaſs be employed as directed by the Dublin college, it will unite with the ſulphur by ſimple trituration, and will render one third of its weight of ſulphur ſoluble in water. If carbonate of potaſs be uſed as directed by the other colleges, it is neceſſary to bring the ſulphur into a ſtate of fuſion; it then acts upon the carbonate, and expels the carbonic acid. It is evident, that to combine with the ſame quantity of ſulphur, a larger proportion of carbonate of potaſs than of potaſs is neceſſary; but the quantity ordered by the London college is certainly much too large. Göttling directs only one part of carbonate of potaſs to two of ſulphur: and to ſave the crucible, he directs the mixture, as ſoon as it melts, to be poured into a heated mould, anointed with oil. The colleges alſo differ in the mode of conducting the proceſs. The London and Dublin colleges direct the alkaline ſalt to be projected upon the melted ſulphur. The fault of this proceſs is, that there is a conſiderable loſs of ſulphur by ſublimation, which is avoided, if the ſubſtances be previouſly intimately mixed, and brought into fuſion by a very gradual and cautious application of heat, according to the proceſs of the Edinburgh college; but, if the fuſion be not very cautiouſly performed, the ſudden extrication of ſo large a quantity of carbonic acid gas, is apt to throw the melted matter out of the crucible, and may be attended with unpleaſant conſequences. La Grange projects one part of ſulphur, on one and a half of potaſs in fuſion, and keeps the compound melted half an hour before he pours it out. If the heat be too great, and the crucible uncovered, the ſulphureous vapour is apt to inflame, but it is eaſily extinguiſhed by covering it up. For the preparation of precipitated ſulphur, Hermbſtadt propoſes to obtain the ſulphuret of potaſs, by heating together in a crucible four parts of ſulphate of potaſs with one of charcoal powder. The charcoal is converted into carbonic acid gas, and the ſulphate into ſulphuret.

Sulphuret of potaſs, properly prepared, is of a liver-brown colour, hard, brittle, and has a vitreous fracture. It has an acrid bitter taſte, and the ſmell of ſulphur. It is exceedingly prone to decompoſition. It is deliqueſcent in the air, and is decompoſed. It is very fuſible, but a ſtrong heat ſeparates the ſulphur by ſublimation. The moment it comes in contact with water, there is a mutual decompoſition. Part of the ſulphur becomes acidified, deriving oxygen from the water, and forms ſulphate of potaſs. Part of the hydrogen of the water decompoſed, combines with

another portion of the ſulphur, and eſcapes in the form of ſulphuretted hydrogen gas: another portion of the hydrogen combines with a third portion of the ſulphur, and remains in ſolution, united with the alkali, in the ſtate of hydroguretted ſulphuret of potaſs. By acids, ſulphuret of potaſs is immediately decompoſed; the acid forms a neutral ſalt with the potaſs, and the ſulphur is ſeparated.

Off. Prep.—Sulph. præc. *Lond. Dub.*

TARTRIS POTASSÆ; olim, TARTARUM SOLUBILE. *Ed.*
Tartrite of Potaſs, formerly, *Soluble Tartar.*

Take of
Carbonate of potaſs, one pound;
Super-tartrite of potaſs, three pounds, or as much as may be ſufficient;
Boiling water, fifteen pounds.

To the carbonate of potaſs diſſolved in the water, gradually add the ſuper-tartrite of potaſs in fine powder, as long as it raiſes any effervescence, which generally ceaſes before three times the weight of the carbonate of potaſs has been added; then ſtrain the cooled liquor through paper, aud after due evaporation ſet it aſide to cryſtallize.

KALI TARTARISATUM. *Lond.*
Tartariſed Kali.

Take of
Prepared kali, one pound;
Cryſtals of tartar, three pounds;
Diſtilled water, boiling, one gallon.

To the ſalt, diſſolved in the water, throw in gradually the cryſtals of tartar powdered: filter the liquor, when cold, through paper; and, after due evaporation by a gentle heat, ſet it apart to cryſtallize.

ALKALI VEGETABILE TARTARISATUM. *Dub.*
Tartariſed Vegetable Alkali.

Take of
Mild vegetable alkali, one pound;
Cryſtals of tartar in very fine powder, two pounds and a half,
Boiling water, fifteen pounds.

Gradually add the tartar to the vegetable alkali diſſolved in the water; after the liquor has cooled, ſtrain it through paper; evaporate it, and let it cryſtallize by cooling ſlowly.

THE tartaric acid is capable of uniting with potaſs in two proportions, forming in the one inſtance a neutral, and in the other

an acidulous ſalt. The latter is an abundant production of nature, but it is eaſily converted into the former, by ſaturating it with potaſs, or by depriving it of its exceſs of acid. It is by the former method that the colleges direct tartrate of potaſs to be prepared, and the proceſs is ſo ſimple, that it requires little comment. For the ſake of economy, we ſhould come as near the point of ſaturation as poſſible; but any ſlight deviation from it will not be attended with much inconvenience. Indeed, it is perhaps adviſable to leave a ſlight exceſs of acid, which, forming a ſmall quantity of very inſoluble ſalt, leaves the remainder perfectly neutral. The evaporation muſt be conducted in an earthen veſſel, for iron diſcolours the ſalt. It is eaſily cryſtallized, and the cryſtals become moiſt in the air. It has an unpleaſant bitter taſte. It is ſoluble in four parts of cold water, and ſtill more ſoluble in boiling water, and it is alſo ſoluble in alcohol. It is totally or partially decompoſed by all acids. On this account it is improper to join it with tamarinds, or other acid fruits; which is too often done in the extemporaneous practice of thoſe phyſicians who are fond of mixing different cathartics together, and know little of chemiſtry. It is alſo totally decompoſed by lime, baryta, ſtrontia, and magneſia, and partially by the ſulphates of potaſs, ſoda, and magneſia, and by the muriate of ammonia.

Medical uſe.—In doſes of a ſcruple, half a drachm, or a drachm, this ſalt is a mild cooling aperient: two or three drachms commonly looſen the belly; and an ounce proves pretty ſtrongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an uſeful addition to the purgatives of the reſinous kind, as it promotes their operation, and at the ſame time tends to correct their griping quality.

CARBONAS SODÆ; olim, SAL ALKALINUS FIXUS FOSSILIS PURIFICATUS. *Ed.*

Carbonate of Soda, formerly, *Purified Fixed Foſſil Alkaline Salt.*

Take of

Impure carbonate of ſoda, any quantity.

Bruiſe it; then boil in water till all the ſalt be diſſolved. Strain the ſolution through paper, and evaporate it in an iron veſſel, ſo that after it has cooled, the ſalt may cryſtallize.

NATRON PRÆPARATUM. *Lond.*

Prepared Natron.

Take of

Barilla, powdered, two pounds;

Diſtilled water, one gallon.

Boil the barilla in four pints of water for half an hour, and ſtrain. Boil the reſiduum with the reſt of the water, and ſtrain. Evaporate the mixed liquors to two pints, and ſet them by for eight days; ſtrain this liquor again: and, after due boiling, ſet it aſide to cryſtallize. Diſſolve the cryſtals in diſtilled water; ſtrain the ſolution, boil, and ſet it aſide to cryſtallize.

ALKALI FOSSILE MITE. *Dub.*
Mild Foſſil Alkali.

Take of
Barilla, in powder, ten pounds;
Water, forty pounds.

Boil the barila in the water, in a covered veſſel, for two hours, agitating it from time to time. Evaporate the filtered ſolution in a wide iron veſſel to dryneſs, taking care that the ſaline maſs remaining be not liquefied by too great a degree of heat, and agitate it with an iron ſpatula, until its colour become white. Laſtly, diſſolve it in boiling water; evaporate, and let it cryſtallize by ſlow refrigeration.

If the ſalt be not pure, repeat the ſolution and cryſtallization.

THESE directions are principally intended for the purification of the Spaniſh barilla, which is a fuſed maſs, conſiſting indeed principally of carbonate of ſoda, but alſo containing charcoal, earths, and other ſalts. From the two firſt cauſes of impurity it is eaſily ſeparated by ſolution and filtration, and the ſalts may be ſeparated by taking advantage of their different ſolubility in cold and in hot water. Frequently the ſoda does not cryſtallize freely, from not being ſaturated with carbonic acid, which is the reaſon why the London college order the ſolution to be expoſed to the atmoſphere for eight days, that it may abſorb carbonic acid, before they attempt the cryſtallization of the ſalts. But the preparation of carbonate of ſoda, by the decompoſition of ſulphate of ſoda, has now become a manufacture, and is carried to ſuch perfection, that its further purification is almoſt unneceſſary for the purpoſes of the apothecary.

Off. prep.—Aqua ſuper-carb. ſodæ. *Ed.* Phoſphas ſodæ, *Ed.* Tartris pot. et ſod. *Ed. Lond. Dub.* Carbonas ferri præcip. *Ed.* Acid benzoic, *Ed.*

AQUA SUPER CARBONATIS SODÆ. *Ed.*
Water of Super-Carbonate of Soda.

This is prepared from ten pounds of water, and two ounces of carbonate of ſoda, in the ſame manner as the water of ſuper-carbonate of potaſs.

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By super-saturating soda with carbonic acid, it is rendered more agreeable to the palate, and may be taken in larger quantities, without affecting the stomach.

PHOSPHAS SODÆ. *Ed.*
Phosphate of Soda.

Take of
  Bones burnt to whiteness, and powdered, ten pounds;
  Sulphuric acid, six pounds;
  Water, nine pounds.

Mix the powder with the sulphuric acid in an earthen vessel; then add the water, and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out. Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, add carbonate of soda, dissolved in warm water, until the effervescence cease. Filter the neutralized liquor, and set it aside to crystallize. To the liquor that remains after the crystals are taken out, add a little carbonate of soda, if necessary, so as to saturate exactly the phosphoric acid, and dispose the liquor, by evaporation to form crystals. Lastly, the crystals are to be kept in a well-closed vessel.

The first part of this process consists in destroying the gelatine of the bones by the action of heat. When burnt to perfect whiteness, they retain their form, but become friable, and consist of phosphate of lime, mixed with a very little carbonate of lime and carbonate of soda. In performing this part of the process, we must take care not to heat the bones to a bright red, as by it they undergo a kind of semi-fusion, and become less soluble. The complete combustion of the charcoal is facilitated by the free contact of the air; we must therefore bring every part in succession to the surface, and break the larger pieces.

In the second part of the process, the phosphate of lime is decomposed by the sulphuric acid. This decomposition is however only partial. The sulphuric acid combines with part of the lime, and forms insoluble sulphate of lime. The phosphoric acid separated from that portion of lime, immediately combines with the rest of the phosphate of lime, and forms super-phosphate of lime, which is not farther decomposable by sulphuric acid.

The super-phosphate of lime, thus formed, is soluble in water: but as the sulphate of lime, with which it is mixed, concretes into

a very solid mass, it is in some measure defended from the action of water. On this account the whole mass is directed to be digested for three days in vapour, by which means it is thoroughly penetrated and prepared for solution in the boiling water, which is afterwards poured on it. It is probably to render the subsequent solution easier, that Thenard directs the bone-ashes to be made into a thin paste (*bouillie*) with water, before the sulphuric acid is added to them.

Having thus got a solution of super-phosphate of lime, it is next decomposed by carbonate of soda, dissolved in water. This decomposition, likewise, is only partial, as it deprives the super-phosphate of lime of its excess of acid only, and reduces it to the state of phosphate. The phosphate of lime, being insoluble, is easily separated by filtration, and the phosphate of soda remains in solution. According to Thenard, the nicest point in the whole process, is the determination of the proper quantity of carbonate of soda to be added. As the phosphate of soda does not crystallize freely unless there be a slight excess of base, he directs that a little more carbonate of soda be added than what is merely sufficient to saturate the excess of acid in the super-phosphate of lime, but not to continue the addition until it cease to produce any precipitate. We must also take care not to carry the evaporation of a solution of phosphate of soda so far as to form a pellicle, for it then concretes into an irregular mass, and does not form beautiful crystals. After each crystallization, we must examine the liquor which remains, and if it be acid, or merely neutral, add to it a little of the solution of carbonate of soda. In this way Thenard got from 2100 parts of bone-ashes, 700 of sulphuric acid, and 667 of carbonate of soda, 885 of phosphate of soda. According to Fourcroy, phosphate of lime consists of 0.41 acid and 0.59 lime, and super-phosphate of lime of 0.54 acid and 0.46 lime; phosphate of lime, treated with sulphuric acid, is only deprived of 0.24 lime, and changed into 0.76 of super-phosphate, consisting of 0.59 phosphate of lime, and 0.17 phosphoric acid, and it is only with this portion of acid that we are able to combine soda. Fourcroy is also of opinion, that phosphate of lime requires only 0.4 of its weight of sulphuric acid to decompose it, whereas 0.6 are employed by the Edinburgh college, and others use even 0.7. This is not only, therefore, a waste of acid, but renders the product impure, by being mixed with sulphate of soda, which is sometimes actually the case in the phosphate of soda of commerce. Besides, as bone-ashes are of a very little value, it is better that a portion of them should escape undecomposed, than that an excess of acid should be added to them.

Mr. Funcke, of Linz, has discovered a still more economical and expeditious method. It consists in saturating the excess of lime in

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calcined bones with diluted ſulphuric acid, and then diſſolving the remaining phoſphate of lime in nitric acid. To this ſolution he adds an equal quantity of ſulphate of ſoda, and then recovers the nitric acid by diſtillation. The phoſphate of ſoda is then ſeparated from the ſulphate of lime, by the affuſion of water and cryſtallization.

Phoſphate of ſoda cryſtallizes in rhomboidal priſms, terminated by three-ſided pyramids. Its taſte reſembles that of common ſalt. At 60° it is ſoluble in four parts of water, and at 212° in two. It effloreſces in the air. By heat it undergoes the watery fuſion, and at laſt melts into a white maſs. It conſiſts, according to Thenard, of 15 phoſphoric acid, 19 ſoda, and 66 water of cryſtallization. It is decompoſed by moſt of the ſalts having an earthy baſe.

Medical uſe.—Phoſphate of ſoda was introduced into the practice of phyſic by the ingenious Dr. Pearſon of Leiceſter ſquare, London. It poſſeſſes the ſame medical qualities as ſulphate of ſoda, and the tartrate of potaſs and ſoda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over theſe two ſalts of being much leſs nauſeous than they are. Its taſte is extremely ſimilar to that of common ſalt; and when given in a baſon of water-gruel, or veal-broth made without ſalt, it is ſcarcely perceptible by the palate, and conſequently is well adapted for patients whoſe ſtomachs are delicate, and who have an antipathy againſt the other ſalts. The only objection to its general uſe is the very great difference between its price and that of ſulphate of ſoda, a difference which might certainly be diminiſhed.

MURIAS SODÆ EXSICCATUS. *Ed.*
SAL-COMMUNIS EXSICCATUS. *Dub.*
Dried Muriate of Soda, Dried Common Salt.

Take of

Common ſalt, any quantity.

Roaſt it over the fire in a wide iron veſſel, until it ceaſe to decrepitate, agitating it from time to time.

By this proceſs the muriate of ſoda is reduced into the ſtate in which it is employed for the diſtillation of muriatic acid. It not only deprives it entirely of its water of cryſtallization, which, from being variable in quantity, would otherwiſe render the acid obtained unequal in ſtrength, but alſo deſtroys ſome colouring matter it contains; for if we prepare muriatic acid from cryſtallized muriate of ſoda, we obtain a coloured muriatic acid, while the dried muriate furniſhes a perfectly colourleſs one.

Off. Prep.—Acid muriat. *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.*

SULPHAS SODÆ; olim, SAL GLAUBERI. *Ed.*
Sulphate of Soda; formerly, *Glaubers Salt.*

Diſſolve the acidulous ſalt which remains after the diſtillation of muriatic acid, in water; and having mixed chalk with it to remove the ſuperfluous acid, ſet it aſide until the ſediment ſubſides, then evaporate the liquor decanted from them, and ſtrain through paper, ſo that it may cryſtallize.

NATRON VITRIOLATUM. *Lond.*
Vitriolated Natron.

Take of
The ſalt which remains after the diſtillation of the muriatic acid, two pounds;
Diſtilled water, two pints and a half.
Burn out the ſuperfluous acid with a ſtrong fire, in an open veſſel; then boil it for a little in the water: ſtrain the ſolution, and ſet it by to cryſtallize.

ALKALI FOSSILE VITRIOLATUM. *Dub.*
Vitriolated Foſſil Alkali.

Reduce the ſalt, which remains after the diſtillation of muriatic acid, to powder, and diſſolve it in a ſufficient quantity of boiling water. Evaporate the filtered ſolution, and cryſtallize the ſalt by ſlow refrigeration.

THE obſervations we made reſpecting the different methods followed by the colleges, for extracting ſulphate of potaſs from the reſiduum of the diſtillation of nitrous acid, apply in the preſent inſtance, except that the Edinburgh college do not preſerve the ſuperabundant acid when preſent, by ſaturating it with carbonate of ſoda, but get rid of it by ſaturating it with carbonate of lime, with which it forms an inſoluble ſulphate of lime. In fact, the price of ſulphate of ſoda is ſo very ſmall, that it would be no economy to uſe carbonate of ſoda to ſaturate the ſuperabundant acid.

By far the greateſt part of the ſulphate of ſoda is obtained from manufacturers, as a reſult of proceſſes performed for the ſake of other ſubſtances, as in the preparation of muriate of ammonia, oxygenized muriatic acid, &c. It may be economically obtained by making into a paſte with a ſufficient quantity of water, eight parts of burnt gypſum, five of clay, and five of muriate of ſoda. This mixture is burnt in a kiln or oven, then ground to powder, diffuſed in a ſufficient quantity of water, and after being ſtrained, is evaporated and cryſtallized.

Sulphate of ſoda cryſtallizes in ſix-ſided priſms, terminated by

dihedral ſummits. The cryſtals are often irregular, and their ſides are uſually channelled. Their taſte is at firſt ſalt, and afterwards diſagreeably bitter. They are ſoluble in 2.67 parts of water at 60°, and in 0.8 at 212°. In the air they effloreſce. They undergo the watery fuſion, and in a red heat melt. They conſiſt of 23.52 ſulphuric acid, 18.48 ſoda, and 58 water; when dried at 700°, of 56 acid and 44 ſoda. It is decompoſed by baryta and potaſs, and ſalts containing theſe baſes, and by the ſalts of ſilver, mercury, and lead.

Medical uſe.—Taken from half an ounce to an ounce, or more, it proves a mild and uſeful purgative; and in ſmaller doſes, largely diluted, a ſerviceable aperient and diuretic. It is commonly given in ſolution, but it may alſo be given in powder, after it has effloreſced. In this form the doſe muſt be reduced to one half.

TARTRIS POTASSÆ ET SODÆ; olim, SAL RUPELLENSIS. *Edin.*

Tartrite of Potaſs and Soda, formerly *Rochelle Salt.*

It is prepared from the carbonate of ſoda and ſuper-tartrate of potaſs, in the ſame manner as the tartrate of potaſs.

NATRON TARTARISATUM. *Lond.* *Tartariſed Natron.* SAL RUPELLENSIS. *Dub.* *Rochelle Salt.*

Take of
Natron, twenty ounces;
Cryſtals of tartar, powdered, two pounds;
Diſtilled water, boiling, ten pints.

Diſſolve the natron in the water, and gradually add the cryſtals of tartar: filter the liquor through paper; evaporate, and ſet it aſide to cryſtallize.

THE tartaric acid in ſeveral inſtances is capable of entering into combination at the ſame time with two baſes. In the preſent example, the ſuperabundant acid of the ſupertartrate of potaſs is neutralized with ſoda, and in place of a mixture of tartrate of potaſs and tartrate of ſoda, each poſſeſſing their own properties, there reſults a triple ſalt, having peculiar properties.

The tartrate of potaſs and ſoda forms large and very regular cryſtals, in the form of priſms with eight ſides nearly equal, which are often divided longitudinally, almoſt through their axis. It has a bitter taſter It is ſoluble in about five parts of water, and effloreſces in the air, It is decompoſed by the ſtrong acids, which combine with the ſoda, and ſeparate ſuper-tartrate of potaſs, and by baryta and lime. By heat its acid is deſtroyed. It conſiſts of 54 tartrate of potaſs, and 46 tartrate of ſoda.

Medical use.—It was introduced into medical practice by M. Seignette, an apothecary at Rochelle, whose name it long bore. It is still frequently employed; and though less agreeable than the phosphate of soda, it is much more so than the sulphate of soda. It is less purgative than these, and must be given in larger doses.*

AQUA AMMONIÆ; olim, AQUA AMMONIÆ CAUSTICÆ. *Ed.*
Water of Ammonia, formerly, *Water of Caustic Ammonia.*

Take of
Muriate of ammonia, one pound;
Quicklime, fresh burnt, one pound and an half;
Distilled water, one pound;
Water, nine ounces.

Pour the water on the powdered lime, contained in an iron or earthen vessel, which is then to be covered up until the lime falls to powder. Then mix the muriate, previously ground into very fine powder, thoroughly with the lime, by triturating them together in a mortar, and immediately put the mixture into a retort of bottle glass. Put the retort in a sand bath, and connect with it a Woulfe's apparatus. In the first and smallest bottle, furnished with a tube of safety, put two ounces of the distilled water, and in the second the rest of the distilled water.

The fire is now to be kindled, and gradually increased, until the bottom of the sand pot becomes red. Mix the fluid contained in each of the bottles, and preserve it in small phials, accurately closed.

LIQUOR ALKALI VOLATILIS CAUSTICI. *Dub.*
Liquor of Caustic Volatile Alkali.

Take of
Sal ammonia, sixteen ounces;
Quicklime, fresh burnt, two pounds;
Water, six pounds.

Sprinkle one pound of boiling water upon the lime, placed in a stoneware vessel, and cover up the vessel. Twenty-four hours afterwards, mix the salt with the lime, which will have crumbled to powder, taking care to avoid the vapours. Then put the mixture into a retort, and pour upon it five pounds of water Having previously agitated them, draw off with a moderate heat twenty ounces of liquor into a refrigerated receiver, having luted carefully the joining of the vessels.

The specific gravity of this liquor is to that of distilled water, as 936 to 1000.

AQUA AMMONIÆ PURÆ. *Lond.*
Water of Pure Ammonia.

Take of
Sal ammoniac, one pound;
Quicklime, two pounds;
Water, one gallon.

Add to the lime two pints of the water. Let them ſtand together an hour; then add the ſal ammoniac and the other ſix pints of water boiling, and immediately cover the veſſel. Pour out the liquor when cold, and diſtil off with a ſlow fire one pound.

IN this proceſs the muriate of ammonia is decompoſed by the lime, in conſequence of its having a ſtronger affinity for muriatic acid than ammonia has. It is abſolutely neceſſary that the lime employed be very recently burnt, as the preſence of carbonic acid would render the ammonia partially carbonated. This accident is alſo prevented by the great exceſs of lime uſed, which having a greater affinity for carbonic acid than ammonia has, retains any ſmall quantity of it which may be accidentally preſent. The lime is alſo to be ſlaked before it be added to the muriate of ammonia, becauſe the heat produced during its ſlaking would cauſe a violent diſengagement of ammonia gas, and be attended with great loſs. The water is eſſential to the exiſtence of the ammonia in a liquid form, for in itſelf it is a permanently elaſtic fluid. In the proceſs adopted by the London and Dublin colleges, a much greater quantity of water, however, is uſed than what is ſufficient to abſorb all the ammonia: the reſt is intended to render the decompoſition ſlower and more manageable, and to keep the muriate of lime which remains in the retort in ſolution; for otherwiſe it would concrete into a ſolid maſs, adhering ſtrongly to the bottom of the retort, very difficult to be waſhed out, and often endangering its breaking. As ſoon as the ſlaked lime and muriate of ammonia are mixed, they ſhould be put into the retort, the water poured upon them, and the diſtillation begun: for, by the London proceſs of adding the water boiling hot to the mixture, and letting it ſtand to cool before it is introduced into the retort, there is a very great loſs of ammonia, and for no reaſon whatever. A very ſmall degree of heat is ſufficient for the diſtillation, and the whole ammonia riſes with the firſt portion of water, or even before it. It is therefore neceſſary that the veſſels be very cloſely luted to each other, to prevent it from eſcaping. But this renders the utmoſt care neceſſary in the diſtillation; for too ſudden, or too great a heat, from the rapid diſengagement of gas, or even the expanſion of the air contained in the veſſels, would endanger their burſting.

In the procefs directed in the laft impreffion of the Edinburgh Pharmacopœia, this danger is completely obviated, by difengaging the ammonia in the form of gas, and combining it with the water by means of preffure in a pneumatic apparatus. By this procefs the water fhould be faturated with ammonia; but of this ftrength it is never fold out of the fhops, unlefs particularly inquired for, as for common fale it is always diluted with a certain proportion of water.

We have already mentioned the properties of ammonia in its gafeous form, and its relation to the alkalies. When combined with water, it imparts to it many of thefe properties, and leffens its fpecific gravity. Liquid ammonia, or water faturated with ammonia, contains 74.63 water, and 25.37 ammonia; and its fpecific gravity is 0.9054. When it has the fpecific gravity mentioned by the Dublin college 0.936, it contains about 83 of water, and 17 of ammonia. It affumes its elaftic form, and feparates from the water, when heated to about 130°, and quickly attracts carbonic acid from the atmofphere. It decompofes many of the earthy, and all the metalline falts, and is capable of diffolving or combining with many of the metalline oxides, and even of oxidizing fome of the metals. When pure, water of ammonia does not effervefce with any of the acids, or form a precipitate with alcohol. As it readily abforbs carbonic acid from the atmofphere, the Edinburgh college very properly order it to be kept in fmall phials. By neglecting this precaution in the fhops, it is often perfectly carbonated before the large bottles, in which it is commonly kept, be half done.

Medical ufe.—Water of ammonia is very rarely given internally, although it may be ufed in dofes of ten to twenty drops, largely diluted, as a powerful ftimulant in afphyxia, and fimilar difeafes. Externally it is applied to the fkin as a rubefacient, and in the form of gas to the noftrils, and to the eyes as a ftimulant; in cafes of torpor, paralyfis, rheumatifm, fyncope, hyfteria, and chronic ophthalmia.

Off. prep.—Hydrofulph. ammon. *Ed.* Oleum ammon. *Ed. Lond.* Linim camph. comp. *Lond.* Spt. ammon. fuccinat. *Lond.*

ALCOHOL AMMONIATUM, olim, Spiritus Ammoniæ. *Edin.*

Ammoniated Alcohol, formerly, *Spirit of Ammonia*.

Take of
- Alcohol, thirty-two ounces;
- Quick-lime, recently burnt, twelve ounces;
- Muriate of ammonia, eight ounces;
- Water, eight ounces.

From these ingredients Ammoniated Alcohol is prepared, exactly in the same manner as the water of ammonia.

SPIRITUS AMMONIÆ. *Lond.* SPIRITUS ALKALI VOLATILIS. *Dub.*
Spirit of Ammonia. *Spirit of Volatile Alkali.*

Take of
Proof spirit, three pints;
Sal ammoniac, four ounces;
Potashes, six ounces.
Mix, and distil with a slow fire, one pint and an half.

WHEN muriate of ammonia is decomposed by carbonate of potass, the product is a mixture of carbonate of ammonia with a variable quantity of ammonia; for the carbonate of potass is never saturated with carbonic acid. Again, as diluted alcohol is employed in this process, and one half only is drawn off, it is evident that there is either a want of economy, or the whole alcohol comes over before any of the water. But if the latter supposition be true, there is also a want of economy, for the alcohol will dissolve only the ammonia, and leave the whole carbonate undissolved. The fact is, that when we perform the process as directed by the London and Dublin colleges, a very large proportion of carbonate of ammonia sublimes, which remains undissolved in the distilled liquor; but as this liquor (after the particles of carbonate of ammonia, which were diffused through it, have separated in the form of very regular crystals, adhering to the sides of the vessel) effervesces with acids, the distilled liquor cannot be pure alcohol, but must contain a proportion of water capable of dissolving some carbonate of ammonia.

But to prove the want of chemical knowledge in the contrivers of this process, it is only necessary to mention that the product is unfit for the preparation of the aromatic ammoniated alcohol, as it will not dissolve the volatile oils.

The process now, for the first time, directed by the Edinburgh college, is, therefore, infinitely preferable, as it is not only more elegant, but more economical, and dissolves the volatile oils perfectly.

The Berlin college direct this preparation to be made by simply mixing two parts of alcohol with one of water of ammonia.

Off. prep.—Alcohol ammon. fœtid. *Ed. Dub.* Alcohol ammon. aromat. *Ed. Lond. Dub.* Tinct. Castor. comp. *Ed.* Tinct. guiac. amm. *Ed.* Tinct. opii amm. *Ed.*

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CARBONAS AMMONIÆ; olim, AMMONIA PRÆPARATA. *Edin.*
Carbonate of Ammonia, formerly *Prepared Ammonia.*

Take of
Muriate of ammonia, one pound;
Pure carbonate of lime, (commonly called chalk), dried, two pounds.
Having triturated them ſeparately, mix them thoroughly, and ſublime from a retort into a refrigerated receiver.

AMMONIA PREPARATA. *Lond.* ALKALI VOLATILE MITE. *Dub.*
Prepared Ammonia. *Mild Volatile Alkali.*

Take o
Sal ammoniac, powdered, one pound.
Prepared chalk, two pounds.
Mix and ſublime. *Lond.*
Dry them with the greateſt care: and having mixed them, introduce them into a retort. By means of heat, ſublime the alkaline ſalt, which is to be received in a proper veſſel. (*Dub.*)

In this proceſs the two ſubſtances employed undergo a mutual decompoſition, the muriatic acid combining with the lime, and the carbonic acid with the ammonia. The proportion of carbonate of lime directed, is perhaps more than ſufficient to decompoſe the muriate of ammonia; but it is the ſafe ſide to err on; for it is only ſometimes inconvenient, from obliging us to make uſe of larger veſſels, whereas, if any portion of the muriate of ammonia were to remain undecompoſed, it would ſublime along with the carbonate, and render the product impure. Göttling uſes three parts of chalk to two of muriate of ammonia, but he dries his chalk before he weighs it. The chalk is always to be very carefully dried before it is uſed in this preparation, as the preſence of moiſture injures the product. The ingredients are to be thoroughly mixed by trituration, before they are introduced into the retort, that no part of the muriate of ammonia may eſcape decompoſition; and we are even ſometimes directed to cover the ſurface of the mixture, after they are in the retort, with powdered chalk. This, however, is unneceſſary. Carbonate of lime does not act on muriate of ammonia till a conſiderable heat be applied. Göttling ſays, that the ſublimation muſt be conducted in the open fire, and therefore he uſes an earthen-ware cucurbit, with a tubulated capital. When a glaſs retort is employed, it ſhould have a very wide neck; and the beſt form for the receiver is cylindrical, as

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it enables us to get out the carbonate of ammonia condenſed in it without breaking it. The reſiduum which remains in the retort, furniſhes muriate of lime by lixiviation and evaporation.

Sometimes carbonate of potaſs is employed for the preparation of carbonate of ammonia. The theory of the proceſs is the ſame, and the decompoſition is effected at a lower temperature. But as potaſs is very rarely ſaturated with carbonic acid, part of the ammonia is evolved in the form of gas, which, if not permitted to eſcape, will burſt the veſſels. To prevent this loſs, therefore, Mr. Göttling uſes a cucurbit and capital, furniſhed with a bent tube, which is to be immerſed in a phial of water: by which contrivance, while the carbonate of ammonia is condenſed in the capital, the gaſeous ammonia is abſorbed by the water. When potaſs is uſed, the reſiduum contains muriate of potaſs.

Carbonate of ammonia is obtained in the form of a white cryſtallized maſs, of a fibrous texture, having the ſmell and taſte of ammonia, but weaker. It is ſoluble in twice its weight of cold water, and is more ſoluble as the temperature of the water increaſes; but when it approaches to a boiling heat, the carbonate is volatilized. It is inſoluble in alcohol. It is permanent in the air, and is not decompoſed, but is eaſily vaporized by heat. It is ſaid to vary very much in its compoſition, and to contain more ammonia, and leſs acid and water, in proportion to the high temperature employed in preparing it, the quantity of alkali varying from 50 to 20 *per cent.* It is decompoſed by moſt of the acids, and all the alkaline, and ſome of the earthy, baſes; by the earthy ſulphates, except thoſe of baryta and ſtrontia; by the earthy ſulphates, muriates, and fluates; by the nitrates of baryta, and ſuperphoſphate of lime.

Medical uſe.—Carbonate of ammonia exactly reſembles ammonia in its action on the living body; but is weaker, and is principally uſed as ſmelling ſalts in ſyncope and hyſteria.

Off. prep.—Aqua acetitis ammon. *Ed. Lond. Dub.* Ammoniaretum cupri, *Ed. Lond. Dub.*

AQUA CARBONATIS AMMONIÆ; olim, AQUA AMMONIÆ. *Edin.* LIQUOR ALKALI VOLATILIS. *Dub.*

Water of Carbonate of Ammonia, formerly, *Water of Ammonia. Liquor of Volatile Alkali.*

Take of
 Muriate of ammonia,
 Carbonate of potaſs, each ſixteen ounces;
 Water, two pounds.

Having mixed the ſalts, and put them in a glaſs retort, pour the water upon them, and diſtil to dryneſs in a ſand bath, gradually increaſing the heat. *Ed.*

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Draw off the liquor by diſtillation, until the reſiduum become dry. The ſpecific gravity of this liquor is to that of diſtilled water as 1110 to 1000. *Dub.*

AQUA AMMONIÆ. *Lond.*
Water of Ammonia.

Take of
Sal ammoniac, one pound;
Potaſhes, one pound and a half;
Water, four pints.
Draw off two pints by diſtillation, with a ſlow fire.

THE product of this proceſs is a ſolution of carbonate of ammonia, while the reſiduum in the retort is muriate of potaſs. In this inſtance, the decompoſition of the muriate of ammonia cannot be effected by carbonate of lime, becauſe the addition of the water prevents the application of the neceſſary heat, whereas carbonate of potaſs acts at a moderate temperature. The directions of the London college differ from thoſe of the other colleges in two particulars; in the quantity of water added, and in the proportion of carbonate of potaſs employed. The addition of more water than what is to be drawn off by diſtillation muſt increaſe the ſize of the apparatus employed, an inconvenience always to be avoided, if poſſible. With regard to the quantity of carbonate of potaſs employed, from calculation and the authority of the beſt writers, for I do not ſpeak from experience, I am diſpoſed to think the London college in the right; for the 42.75 parts of muriatic acid in 100 parts of muriate of ammonia, require 84.12 of potaſs to ſaturate them; but in 100 parts of carbonate of potaſs, there are not above 50 parts of potaſs, ſo that carbonate of potaſs is not capable of decompoſing an equal weight of muriate of ammonia. But it is more economical, as well as more ſcientific, to prepare this ſolution by diſſolving a certain proportion of carbonate of ammonia in water.

Off. prep.—Oxid. hyd. ciner. *Ed. Dub.* Linim camph. *Dub.* Pil. ammoniaret cupri, *Ed.*

LIQUOR VOLATILIS, SAL, ET OLEUM, CORNU CERVI. *Lond.*
The Volatile Liquor, Salt, and Oil, of Harts-horn.

Take of
Harts-horn, ten pounds.
Diſtil with a fire gradually increaſed. A volatile liquor, ſalt, and oil, will aſcend.
The oil and ſalt being ſeparated, diſtil the liquor three times.

To the ſalt add an equal weight of prepared chalk, and ſublime thrice, or till it become white.

The ſame volatile liquor, ſalt, and oil, may be obtained from any animal ſubſtance, except fat.

Liquor Volatilis Cornu Cervini. *Dub.*
Volatile Liquor of Harts-horn.

Take of
Harts-horn, any quantity.

Put it into a retort, and diſtil with a gradually-increaſed heat, the volatile liquor, ſalt, and oil. Then repeat the diſtillation of the volatile liquor until it becomes as limpid as water, ſeparating by filtration the oil and ſalt after each diſtillation.

The ſpecific gravity of this liquor is to that of diſtilled water as 1110 to 1000.

If harts-horn cannot be had, the bones of any other animal may be ſubſtituted for them.

The wholeſale dealers have very large pots for this diſtillation, with earthen heads, almoſt like thoſe of the common ſtill; for receivers, they uſe a couple of oil jars, the mouths of which are luted together; the pipe that comes from the head, is connected by means of an adopter with the lower jar, which is alſo furniſhed with a cock for drawing off the fluids condenſed in it. The upper jar is entire, and in it is condenſed the ſolid carbonate of ammonia. When a large quantity of the ſubject is to be diſtilled, it is cuſtomary to continue the operation for ſeveral days ſucceſſively; only unluting the head occaſionally, to put in freſh materials. When the upper jar becomes entirely filled with carbonate of ammonia, it cracks. It is then to be removed, the ſalt to be taken out of it, and a freſh one ſubſtituted in its place.

When only a ſmall quantity of ſpirit or ſalt is wanted, a common iron pot, ſuch as is uſually fixed in ſand furnaces, may be employed, an iron head being fitted to it. The receiver ought to be large, and a glaſs, or rather tin, adopter inſerted between it and the pipe of the head.

The diſtilling veſſel being charged with pieces of horn, a moderate fire is applied, which is ſlowly increaſed, and raiſed at length almoſt to the utmoſt degree. At firſt water ariſes, which gradually acquires colour and ſmell, from the admixture of empyreumatic oil and ammoniacal ſalts; carbonate of ammonia next ariſes, which at firſt diſſolves, as it comes over, in the water, and thus forms what is called the *ſpirit.* When the water is ſaturated, the remainder of the ſalt concretes in a ſolid form to the ſides of the recipient. If it be required to have the whole of the ſalt ſolid, and undiſſolved, the water ſhould be removed as ſoon as the ſalt

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begins to ariſe, which may be known by the appearance of white fumes; and that this may be done the more commodiouſly, the receiver ſhould be left unluted, till this firſt part of the proceſs be finiſhed. The white vapours which now ariſe, ſometimes come over with ſuch vehemence as to throw off or burſt the receiver; to prevent this accident, it is convenient to have a ſmall hole in the luting, which may be occaſionally ſtopt with a wooden peg, or opened, as the operator ſhall find proper. Laſtly, the oil ariſes, which acquires greater colour and conſiſtency as the operation advances. Carbonate of ammonia ſtill comes over, but it is partly diſſolved in the hot oily vapour. At the ſame time, there is a conſiderable diſengagement of gas, conſiſting of a mixture of carburetted hydrogen, often containing ſulphur and phoſphorus, and of carbonic acid.

All the liquid matters being poured out of the receiver, the ſalt which remains adhering to its ſides, is to be waſhed out with a little water, and added to the reſt. It is convenient to let the whole ſtand for a few hours, that the oil may the better diſengage itſelf from the liquor, ſo as to be firſt ſeparated by a funnel, and afterwards more perfectly by filtration through wet paper.

None of theſe products, except perhaps a ſmall quantity of the latter, exiſt ready formed in the matter ſubjected to the diſtillation, but are produced by a new arrangement of its conſtituents. For the production of ammonia, it is abſolutely neceſſary that it contain nitrogen, or be what we have called a quaternary oxide. Although ſome vegetable, and moſt animal ſubſtances, are of this kind, yet only the moſt ſolid parts of animals, ſuch as bone and horn, are employed for the production of ammonia; becauſe they furniſh it leſs mixed with other ſubſtances, are eaſily obtained, and at little expence, and are very manageable in the diſtillation. On the application of heat, as ſoon as all the water which they contained is expelled, their elements begin to act on each other, and to form binary, or at moſt ternary compounds. Water is formed of part of the oxygen and hydrogen, ammonia of nitrogen and hydrogen, carbonic acid of carbon and oxygen, then oil of hydrogen and carbon, while the ſuperfluous carbon remains in the retort in the ſtate of charcoal. As the formation of theſe ſubſtances is ſimultaneous, or in immediate ſucceſſion, they are not obtained ſeparately, but are mixed with each other. The water is ſaturated with carbonate of ammonia, and impregnated with empyreumatic oil, while the carbonate of ammonia is diſcoloured with oil; and the oil contains carbonate of ammonia diſſolved in it. They may, however, be ſeparated from each other in a great meaſure, in the manner already deſcribed. But a ſmall portion of oil obſtinately adheres both to the ſalt and its ſolution, which conſtitutes the only difference between ſalt and ſpirit of harts-

horn, as they are called, and the purer carbonate of ammonia, as obtained by the decompoſition of muriate of ammonia.

AQUA ACETITIS AMMONIÆ; vulgo, SPIRITUS MINDERI. *Ed.* AQUA AMMONIÆ ACETATÆ. *Lond.* LIQUOR ALKALI VOLATILIS ACETATI. *Dub.*

Water of Acetite of Ammonia, commonly called *Spirit of Mindererus.* *Water of Acetated Ammonia.* *Liquor of Acetated Volatile Alkali.*

Take of

Carbonate of ammonia in powder, any quantity, *Ed.* (two ounces, *Lond. Dub.*)

Pour upon it as much diſtilled acetous acid as may be ſufficient to ſaturate the ammonia exactly, *Ed.* (About four pints, *Lond.* Three pounds and a half, *Dub.*)

By this proceſs we obtain acetate of ammonia, diſſolved in the water of the acetic acid: but as this is apt to vary in quantity, the ſolution alſo varies in ſtrength, and the cryſtallization of the ſalt is attended with too much difficulty to be practiſed for pharmaceutical purpoſes. Its cryſtals are long, ſlender, and flatted, of a pearly white colour, and of a cool ſweetiſh taſte, are very deliqueſcent, melt at 170°, and ſublime at 250°. It is decompoſed by the acids, alkalies, and ſeveral of the earths, and metalline ſalts; and when in ſolution, its acid is decompoſed ſpontaneouſly, and by heat.

Different propoſals have been made to get a ſolution of greater ſtrength and uniformity, than that ſtill retained by the Britiſh colleges. Mr. Lowe ſaturates four ounces of carbonate of potaſs with diſtilled vinegar, and evaporates the ſolution to 36 ounces. He then mixes it with two ounces of muriate of ammonia, and diſtils the mixture in a glaſs retort. Acetate of ammonia comes over. The laſt edition of the Pruſſian Pharmacopœia prepares it by ſaturating three ounces of carbonate of ammonia with a ſtrong acetic acid, (obtained by diſtillation from acetate of ſoda, diſſolved in two parts of water, and decompoſed by ſulphuric acid), and diluting the ſolution with water, ſo that it ſhall weigh twenty-four ounces. One ounce, therefore, contains the alkali of a drachm of carbonate of ammonia.

Medical uſe.—Acetate of ammonia, when aſſiſted by a warm regimen, proves an excellent and powerful ſudorific; and as it operates without quickening the circulation or increaſing the heat of the body, it is admiſſible in febrile and inflammatory diſeaſes, in which the uſe of ſtimulating ſudorifics are attended with danger. Its action may likewiſe be determined to the kidneys, by

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walking about in a cool air. The common doſe is half an ounce, either by itſelf, or along with other medicines adapted to the ſame intention.

HYDRO-SULPHURETUM AMMONIÆ. *Ed.*
Hydro-Sulphuret of Ammonia.

Take of

Water of ammonia, four ounces;

Subject it in a chemical apparatus to a ſtream of the gas, which ariſes from

Sulphuret of iron, four ounces,

Muriatic acid, eight ounces, previouſly diluted with two pounds and a half of water.

Sulphuret of Iron is conveniently prepared for this purpoſe from

Purified filings of iron, three parts;

Sublimed ſulphur, one part.

Mixed and expoſed to a moderate degree of heat in a covered crucible, until they unite into a maſs.

Sulphuretted hydrogen is capable of combining with different baſes in the manner of an acid. In the preſent preparation, it is combined with ammonia. It is obtained by decompoſing ſulphuret of iron with muriatic acid. As ſoon as the acid, by its ſuperior affinity, ſeparates the iron from the ſulphur, the latter immediately re-acts on the water, the oxygen of which forms with one portion of it ſulphuric acid, while the hydrogen diſſolves another portion, and forms ſulphuretted hydrogen gas. The combination of this with ammonia is facilitated by reduction of temperature, and by making it paſs through a column of the water of ammonia, by means of an apparatus, ſuch as Woulfe's, or Nooth's. Trommſdorff has propoſed, that the ſulphuretted hydrogen gas ſhould be obtained by the decompoſition of ſulphuret of potaſs; but in this way its formation is too rapid to be eaſily managed. Göttling ſays, that the acid ſhould be added gradually, and that the whole muſt be conſtantly agitated. But theſe precautions are rendered more unneceſſary, by diluting the acid in the degree directed by the pharmacopœia. Mr. Cruickſhank, who firſt ſuggeſted the uſe of hydro-ſulphuret of ammonia in medicine, directs the ſulphuret of iron to be prepared by heating a bar of iron to a white heat in a ſmith's forge, and rubbing againſt the end of it a roll of ſulphur. The iron at this temperature immediately combines with the ſulphur, and forms globules of ſulphuretted iron, which ſhould be received in a veſſel filled with water. It is, however, more conveniently obtained in the manner direct-

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ed by the college. Prouft has proved that iron is capable of combining with two proportions of fulphur. At a high temperature 100 parts of iron combine with 60 of fulphur, and form a compound of a dull blackifh colour. In this ftate it is fit for the production of fulphuretted hydrogen gas. At a lower temperature the fame quantity of iron takes up 90 of fulphur, acquires a greenifh yellow colour, and in every refpect refembles native pyrites. This cannot be decompofed by acids, and is therefore unfit for the production of gas; but it may be reduced to the ftate of iron fulphuretted to the minimum, by expofing it to a fufficiently-high temperature, or by melting it with half its weight of iron filings. It was probably from not attending to the different ftates of fulphuretted iron, that fome of the German chemifts failed in their attempts to procure from it fulphuretted hydrogen gas, and had recourfe to fulphuret of potafs. As the proportions have been mif-ftated in an elementary work of great authority, it may be proper to recapitulate them.

	Sulphuretted Iron.			Super-sulphuretted Iron.		
Iron,	100	or	62.5	100	or	52.63
Sulphur,	60		37.5	90		47.37
	160		100	190		100

Medical ufe.—Hydro-fulphuret of ammonia, or more correctly, fulphuretted hydroguret of ammonia, acts powerfully on the living fyftem. It induces vertigo, drowfinefs, naufea, and vomiting, and leffens the action of the heart and arteries. It therefore feems to be a direct fedative. According to the doctrine of the chemical phyfiologifts, it is a powerful difoxygenizing remedy. It has only been ufed in diabetes by Dr. Rollo and others, under the name of Hepatized ammonia, in dofes of five or ten drops twice or thrice a-day.

CHAP. IV.

EARTHS, AND EARTHY SALTS.

MURIAS BARYTÆ. *Edin.*
Muriate of Baryta.

Take of
Carbo ate of baryta,
Muriatic acid, one part;
Water, three parts.

Add the carbonate, broken into little bits, to the water and acid, previoufly mixed. After the effervefcence has ceafed, digeft for an hour, ftrain the liquor, and fet it afide to cryftallize. Repeat the evaporation as long as any cryftals are formed.

If the carbonate of baryta cannot be procured, the muriate may be prepared in the following manner from the fulphate.

Take of
Sulphate of baryta, two pounds;
Charcoal of wood, in powder, four ounces.

Roaft the fulphate with fire, that it may be more eafily reduced to a very fine powder, with which the charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a ftrong fire for fix hours. Then triturate the matter well, and throw it into fix pounds of water in an earthen or glafs veffel, and mix them by agitation, preventing as much as poffible the action of the air.

Let the veffel ftand in a vapour bath until the part not diffolved fhall fubfide, then pour off the liquor. On the undiffolved part pour four pounds more of boiling water, which, after agitation and depofition, are to be added to the former liquor. Into the liquor, when ftill warm, or if it fhall have cooled, again heated, drop muriatic acid as long as it excites any effervefcence. Then ftrain it and evaporate it fo as to cryftallize.

In the materia medica of the Edinburgh college, the carbonate of baryta is introduced, for the purpofe of forming the muriate; but as that mineral is not very common, and fometimes not to be procured, it became neceffary to defcribe the manner of preparing the muriate from the fulphate. This is, however, attended with

very confiderable difficulties, on account of the very ftrong attraction which fubfifts between the fulphuric acid and baryta.

The fulphate of baryta may be decompofed,

1. By compound affinity, by means of carbonate of potafs or muriate of lime.

Carbonate of potafs is capable of effecting this decompofition, either in the dry or humid way. Klaproth boils fixteen ounces of finely-powdered fulphate of baryta with 32 ounces of purified carbonate of potafs, and five pounds of water, for an hour in a tin kettle, conftantly agitating the mixture, and renewing the water as it evaporates. He then allows it to fettle, pours off the fluid, which is a folution of fulphate of potafs, and edulcorates the precipitate with plenty of water. He next diffolves the carbonate of baryta, which it contains, in muriatic acid. The portion of fulphate which is not decompofed, may be treated again in the fame manner.

On the other hand, Van Mons mixes equal parts of fulphate of baryta and carbonate of potafs with one fourth of their weight of charcoal all in powder, and heats the mixture to rednefs in a crucible. When it cools he wafhes out the fulphate and fulphuret of potafs with water, then boils the refiduum with a little potafs, and wafhes it again. The carbonate of baryta thus obtained, he diffolves in muriatic acid.

But by thefe methods of decompofing the fulphate of baryta, we do not get rid of the metallic fubftances which it often contains, and render the muriate thus prepared unfit for medical ufe. But the metalline muriates may be expelled, according to Weftrumb, by heating the falt to rednefs as long as any fumes arife. The pure muriate of baryta is then to be diffolved in water and cryftallized. Göttling, with the fame intention, of getting rid of metalline fubftances, choofes fulphate of baryta, perfectly colourlefs, and treats it with muriatic or nitro-muriatic acid before he proceeds to decompofe it.

La Grange has propofed a new method of decompofing the fulphate of baryta, by means of muriate of lime, which he prepares from the refiduum of the decompofition of muriate of ammonia by lime, by diffolving it in a fmall quantity of hot water, and evaporating it to drynefs. He mixes equal parts of this muriate with fulphate of baryta in powder, and projects it by fpoonfuls into a crucible previoufly heated to rednefs. When it is all in complete fufion, he pours it out upon a polifhed ftone previoufly heated. The matter, which cracks as it cools, has a whitifh grey colour, is very hard, fonorous, and deliquefcent, is now to be boiled in about fix times its weight of diftilled water,

its ſolution filtered, and the reſiduum boiled in a ſmaller quantity of water. The mixed ſolutions are then evaporated to a pellicle, and on cooling furniſh beautiful cryſtals of muriate of baryta, which are to be waſhed with cold water, and purified by a ſecond ſolution and cryſtallization. The mother water of the firſt cryſtallization ſtill contains muriate of baryta, which may be ſeparated from the muriate of lime, with which it is mixed, by repeated ſolutions and cryſtallizations. La Grange thinks that this proceſs not only ſaves time, fuel, and muriatic acid, but that it furniſhes a purer muriate of baryta than the following proceſs.

2. By decompoſing its acid, by means of charcoal.

The acid of the ſulphate of baryta is decompoſed at a very high temperature by charcoal. At ſuch a temperature charcoal has a greater affinity for oxygen than ſulphur has; it therefore decompoſes ſulphuric acid, by depriving it of its oxygen, and flies off in the ſtate of carbonic oxid or acid gas, while the ſulphur combines with the baryta. On adding water to the ſulphuret thus formed, new combinations take place. A portion of ſulphate of baryta is regenerated, while hydroguretted ſulphuret, and ſulphuretted hydroguret of baryta remain in ſolution. This ſolution is exceedingly prone to decompoſition, and muſt therefore be preſerved from the action of the air as much as poſſible. It alſo cryſtallizes by cooling, and therefore ſhould be kept at a boiling heat. On the addition of muriatic acid, there is a violent effervеſcence and diſengagement of ſulphuretted hydrogen gas, which muſt be avoided as much as poſſible, by performing the operation under a chimney, while very pure muriate of baryta remains in ſolution. When prepared in this way, it cannot be contaminated with any of the noxious metals, as their compounds with ſulphur and hydrogen are not ſoluble. On this account, therefore, it is the proceſs adopted by the Edinburgh college.

Muriate of baryta commonly cryſtallizes in tables. It has a diſagreeable bitter taſte; is ſoluble in five parts of water at 60°, and in leſs boiling water. It is ſcarcely ſoluble in alcohol; and its ſolution burns with a yellow flame. It cryſtallizes by evaporation: its cryſtals are permanent; and by the action of heat decrepitate, dry, and melt. When cryſtallized it contains 20 acid, 64 baryta, and 16 water; when dried, 23.8 acid, and 76.2 baryta. It is decompoſed by the ſulphates, nitrates, and ſulphites; and by the alkaline phoſphates, borates, and carbonates. When pure it has no colour; does not deliqueſce; does not burn with a red or purple flame when diſſolved in alcohol; and is not precipitated by gallic acid, pruſſiate of potaſs and iron, or hydro-ſulphuret of ammonia. By waſhing with alcohol muriate of baryta ren-

dered impure by the presence of muriate of iron, the latter alone is dissolved.

It is commonly given in solution.

SOLUTIO MURIATIS BARYTÆ. *Edin.*

Solution of Muriate of Baryta.

Take of

Muriate of baryta, one part;
Distilled water, three parts. Dissolve.

The proportion of water directed here for the solution of muriate of baryta, is considerably less than what is stated to be necessary by the writers on chemistry. It is however sufficient, even at the lowest ordinary temperatures; a circumstance which should be attended to in making saturated solutions of saline bodies.

Medical use.—Muriate of baryta is generally said by writers on the materia medica to be a *stimulant* deobstruent; and yet Hufeland, one of its greatest supporters, says, that it succeeds better in cases attended with inflammation and increased irritability than with atony and torpor. When given in large doses, it certainly produces nausea, vomiting, diarrhœa, vertigo, and death.

Its effects on a morbid state of the body are also disputed. Some assert that it is of advantage in no disease; while others bestow upon it the most unqualified praises. By the latter, it is principally celebrated,

1. In all cases of scrofula.
2. In obstructions and tumors,
3. In cases of worms.
4. In cutaneous diseases.

The dose of the solution at first, is five or ten drops twice or thrice a-day, to be gradually and cautiously increased to as much as the patient can bear.

The solution is also used externally as a stimulating and gently-escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

AQUA CALCIS. *Edin.*

Lime Water.

Take of

Fresh-burnt lime, half a pound;

Put it into an earthen vessel, and gradually sprinkle on it four ounces of water, keeping the vessel shut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water by agita-

tion. After the lime has fubfided, repeat the agitation; and let this be done about ten times, always keeping the veffel fhut, that the free accefs of the air may be prevented. Laftly, let the water be filtered through paper, placed in a funnel, with glafs rods interpofed between them, that the water may pafs as quickly as poffible. It muft be kept in very clofe bottles.

Lond.

Take of
 Quicklime, half a pound;
 Boiling diftilled water, twelve pints.
Mix and fet them afide in a covered veffel for an hour; then pour off the liquor, which is to be kept in a clofe-ftopt veffel.

Dub.

Take of
 Lime recently burnt;
 Boiling water, each one pound.
Put the lime into an earthen veffel, and fprinkle the water upon it, keeping the veffel fhut while the lime grows warm and falls into powder; then pour upon it twelve pounds of water, and fhut the veffel, agitating it frequently for twenty-four hours; laftly, filter the water through paper, placed in a covered funnel, and keep it in well-clofed bottles.

We have already had occafion to fpeak of the properties of lime, and fhall therefore now confine our remarks to the folution of it in water, commonly called Lime-water. In making this, we fhould firft add only fo much water as is fufficient to flake the lime, which reduces it to a fine powder, eafily diffufed through water; for if we add more water at firft, it forms a pafte with the external part of the lime, and defends the internal from the action of the water. During the whole procefs, the air muft be excluded as much as poffible; as lime has a very ftrong affinity for carbonic acid, and attracts it from the atmofphere. The proportion of water ufed is fcarcely able to diffolve one tenth of the lime; but lime is of little value; and our object is to form a faturated folution quickly and eafily. Lime is not more foluble in hot water than in cold; therefore it is unneceffary to ufe boiling water. The London college decant their folution from the undiffolved lime; but in this way we are not fo fure of a perfectly-tranfparent folution as by filtration; and if we ufe the precautions directed by the other colleges, it may be performed without the lime abforbing a perceptible quantity of carbonic acid. The bottles in which lime-water is kept, fhould be perfectly full, and well corked.

Lime-water is tranfparent and colourlefs. It has an auftere

acrid taſte, and affects vegetable colours as the alkalies do. It enters very readily into combination with all the acids, ſulphur, and phoſphorus; and decompoſes the alkaline carbonates, phoſphates, fluates, borates, oxalates, tartrates, and citrates.

Medical uſe.—When applied to the living fibre, lime-water corrugates and ſhortens it; it therefore poſſeſſes aſtringent powers. It is alſo a powerful antacid, or at leaſt it combines with and neutralizes acids when it comes in contact with them. It alſo diſſolves mucus, and kills inteſtinal worms. From poſſeſſing theſe properties, it is uſed in medicine, in diſeaſes ſuppoſed to ariſe from laxity and debility of the ſolids, as diarrhœa, diabetes, leucorrhœa, ſcrofula, and ſcurvy; in affections of the ſtomach accompanied with acidity and flatulence; when the inteſtines are loaded with mucus; and in worms. Lime-water is ſcarcely capable of diſſolving, even out of the body, any of the ſubſtances of which urinary calculi conſiſt; it has therefore no pretenſions to the character of a lithontriptic. It has been alſo recommended in cruſta lactea, in cancer, and in chronic cutaneous diſeaſes. Externally, it is applied to ill-conditioned ulcers, gangrenous ſores; as a waſh in tinea capitis and pſora; and as an injection in gonorrhœa, fiſtulas, and ulcers of the bladder.

When taken internally, its taſte is ſaid to be beſt covered by lukewarm milk. Its doſe is commonly from two to four ounces, frequently repeated, but when long continued it weakens the organs of digeſtion.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.* Oleum lini cum calce, *Ed.*

CARBONAS CALCIS PRÆPARATUS; olim, CRETA PRÆPARATA, ET CANCRORUM LAPILLI; vulgo, OCULI CANCRORUM PRÆPARATI. *Edin.*

Prepared Carbonate of Lime; formerly *Prepared Chalk, and Crabs Stones, commonly called Crabs Eyes.*

CARBONATE of lime, whether the ſofter variety commonly called Chalk, or the harder variety called Crabs Eyes and Crabs Stones, after having been triturated to powder in an iron mortar, and levigated on a porphyry ſtone with a little water, is to be put into a large veſſel, and water to be poured upon it, which, after agitating the veſſel repeatedly, is to be be again poured off, while loaded with minute powder. On allowing the water to ſettle, a ſubtile powder will ſubſide, which is to be dried.

The coarſe powder which the water could not ſuſpend, may be levigated again, and treated in the ſame manner.

QUORANDUM, AQUA NON SOLUBILIUM, PRÆPARATIO. *Lond.*
The Preparation of ſome Subſtances not ſoluble in Water.

Reduce theſe ſubſtances firſt in a mortar to powder; and pouring on a little water, levigate them on a hard and poliſhed, but not calcareous, ſtone, that they may be made as fine as poſſible. Dry this powder on blotting-paper laid on chalk, and ſet it in a warm, or at leaſt a dry, place, for ſome days.

In this manner are to be prepared
- Chalk,
- Coral,
- Crabs claws, firſt broken into ſmall pieces, and waſhed with boiling water,
- Oyſter-ſhells, firſt cleaned from impurities,
- And alſo amber, antimony, calamine, tutty, and verdegris.

CANCRORUM CHELÆ PRÆPARATÆ. *Dub.*
Prepared Crabs Claws.

Waſh the powdered claws in water mixed with about a ſixth part of cauſtic ley, until the adhering ſaline and animal particles be entirely ſeparated from the earthy particles, which are to be waſhed by frequently pouring upon them boiling water. With the addition of a little water, they are then to be ground in a ſtone-ware mortar to powder, which is to be mixed by agitation with a ſufficiently large quantity of water. After a ſhort delay, that is, until the coarſer particles ſubſide, the liquor is to be poured off. The ſame proceſs, by repeating the trituration, may be performed ſeveral times. Laſtly, the very minute powder ſwimming in the water poured off, is to be collected after it has ſubſided, and dried upon paper placed on a bibulous ſtone.

CRETA PRÆPARATA. *Prepared Chalk.*
OSTRÆARUM TESTÆ PRÆPARATÆ. *Prepared Oyſter-ſhells.*
OVORUM TESTÆ PRÆPARATÆ. *Prepared Egg-ſhells.*

Theſe are all to be prepared in the ſame way as crabs claws.

THE preparation of theſe ſubſtances merely conſiſts in reducing them to an impalpable powder. The ſolution of potaſs is uſed by the Dublin college to diſſolve the animal matter contained in the different ſhells; which is apt to keep the carbonate of lime too long ſuſpended, and to give it a bad ſmell if not quickly dried. But theſe inconveniencies are totally avoided by uſing chalk, which, as a medicine, is not inferior to the coſtly coral.

Med. uſe.—Carbonate of lime is commonly called an Abſorbent Earth. It certainly is an antacid; that is, it combines with and neutralizes moſt acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the ſto-

mach accompanied with acidity, eſpecially when at the ſame time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be conſidered as an abſorbent in another point of view; for its beneficial action on burns and ulcers, probably ariſes entirely from its imbibing the moiſture or ichorous matter, as a ſpunge would do, and thus preventing it from acting on the abraded ſurfaces, and excoriating the neighbouring parts.

Off. prep.—Hydrag. cum creta, *Lond.* Pulv. carb. calcis comp. *Ed. Lond.* Pulv. opiat. *Ed.* Trochiſci carb. calcis, *Ed. Lond.*

SOLUTIO MURIATIS CALCIS. *Edin.*

Solution of Muriate of Lime.

Take of

Pure carbonate of lime, that is, white marble, broken into pieces, nine ounces;
Muriatic acid, ſixteen ounces;
Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the efferveſcence has ceaſed, digeſt them for an hour, pour off the liquor, and evaporate it to dryneſs. Diſſolve the reſiduum in its weight and a half of water, and laſtly, filter the ſolution.

From the difficulty of cryſtallizing this ſalt, it is directed to be evaporated to the total expulſion of its water of cryſtallization, as being the ſureſt way of obtaining a ſolution of uniform ſtrength. With the ſame view, Dr. Wood directs that the ſolution ſhould always have a determinate ſpecific gravity.

Its cryſtals are priſms of ſix ſmooth and equal ſides, but they are often ſo aggregated, that they can only be termed acicular. Its taſte is pungent, bitter, and diſagreeable. When heated, it melts, ſwells, and loſes its water of cryſtallization, and at a very high temperature a ſmall part of its acid. It is one of the moſt deliqueſcent ſalts known, and is ſo ſoluble in water, that that fluid ſeems capable of diſſolving twice its weight, or at leaſt forms with it a viſcid liquor; but as it is ſtill capable of attracting moiſture from the air, and of emitting caloric when farther diluted, it can ſcarcely be conſidered as a true ſolution. It is ſoluble in alcohol, and its ſolution burns with a crimſon flame. It is decompoſed by the ſulphuric, nitric, phoſphoric, fluoric, and boracic, acids; by baryta, potaſs, ſoda, and ſtrontia; by moſt of the ſulphates, ſulphites, nitrates, phoſphates, fluates, borates, and the alkaline carbonates. Cryſtallized, it contains 31 acid, 44 lime, and 25 water; dried at a read heat, 42 acid, 50 lime, and 8 water.

Medical uſe.—It was firſt propoſed as a medicine by Fourcroy, and has been lately extolled in ſcrofulous and glandular diſeaſes, and caſes of debility in general, by ſeveral eminent practitioners of our own country, Dr. Beddoes, Dr. R. Pearſon, and Dr. Wood. 30 drops of the ſolution are a ſufficient doſe for children, and a drachm for adults, repeated twice or thrice a-day. In an overdoſe it has produced qualms and ſickneſs; and three drachms and a half killed a dog, the ſtomach of which, upon diſſection, had its villous coat bloodſhot, and in many parts almoſt black and converted into a gelatinous ſlime. The property of this ſalt, of producing intenſe cold during its ſolution, might alſo be applied to medical uſe. For this purpoſe it might be economically prepared, by ſaturating with muriatic acid the reſiduum of the diſtillation of ammonia or of carbonate of ammonia,

PHOSPHAS CALCIS.

CORNU CERVI USTIO. *Lond.* CORNU CERVINUM USTUM. *Dub.*
Phoſphate of Lime. Burnt Hartſhorn.

Burn pieces of hartſhorn till they become perfectly white; then reduce them to a very fine powder.

THE pieces of horn generally employed in this operation, are thoſe left after diſtillation.

In the burning of hartſhorn, a ſufficient fire and the free admiſſion of air are neceſſary. The potter's furnace was formerly directed, for the ſake of convenience; but any common furnace or ſtove will do. Indeed too violent a heat makes their ſurface undergo a kind of fuſion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole leſs ſoluble. If the pieces of horn be laid on ſome lighted charcoal, ſpread on the bottom of the grate, they will be burnt to whiteneſs, ſtill retaining their original form.

According to the analyſis of Merat Guillot, hartſhorn was found to conſiſt of 27. gelatine, 57.5 phoſphate of lime, 1. carbonate of lime, and there was a loſs of 14.5, probably water. Now, as the gelatine is deſtroyed by burning, and the water expelled, the ſubſtance which remains is phoſphate of lime, mixed with leſs than two *per cent.* of carbonate of lime. The bones of animals have lately been diſcovered to contain phoſphate of magneſia.

Medical uſe.—From its white earthy appearance, it was formerly conſidered as an abſorbent earth. But ſince it has been accurately analyzed, that idea has been laid aſide, and its uſe has been ſuggeſted as a remedy in rickets, a diſeaſe in which the deficiency of the natural depoſition of phoſphate of lime in the bones ſeems to be the eſſential or at leaſt moſt ſtriking ſymptom. M. Bonhomme, therefore, gave it to the extent of half a ſcruple,

mixed with phofphate of foda, in feveral cafes with apparent fuccefs. Whatever objections may be made to his theory, the practice certainly deferves a trial.

Off. prep.—Decoct. cornu cervi, *Lond.* Pulv. opiatus, *Lond.* Phofphas fodæ, *Ed.*

MAGNESIA; olim, MAGNESIA USTA. *Ed.*
Magnefia, formerly *Calcined Magnefia.*

Let carbonate of magnefia, put into a crucible, be kept in a red heat for two hours, then put it up in clofe-ftopt glafs veffels.

MAGNESIA USTA. *Lond. Dub.*
Calcined Magnefia.

Take of

White magnefia, four ounces.

Expofe it to a ftrong heat for two hours; and, when cold, fet it by. Keep it in a glafs veffel clofely ftopt.

By this procefs the carbonate of magnefia is freed of its acid and water; and, according to the late Dr. Black's experiment, lofes about $\frac{7}{12}$ of its weight. A kind of opaque foggy vapour is obferved to efcape during the calcination, which is nothing elfe than a quantity of fine particles of magnefia, buoyed off along with a ftream of the difengaged gas. About the end of the operation, the magnefia exhibits a kind of luminous or phofphorefcent property, which may be confidered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in clofe veffels, becaufe it attracts, though flowly, the carbonic acid of the atmofphere.

We have already noticed its general chemical properties.

Med. ufe.—It is ufed for the fame general purpofes as the carbonate. In certain affections of the ftomach, accompanied with much flatulence, magnefia is preferable, both becaufe it contains more magnefia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the ftomach, without any extrication of gas, which is often a troublefome confequence when carbonate of magnefia is employed in thefe complaints.

Off. prep.—Trochifci mag. *Lond.*

CARBONAS MAGNESIÆ; olim, MAGNESIA ALBA. *Ed.*
Carbonate of Magnefia, formerly *Magnefia Alba.*

Take of

Sulphate of magnefia,

Carbonate of potafs, equal weights.

Diffolve them feparately in double their quantity of warm water, and let the liquors be ftrained or otherwife freed from their

feces: then mix them, and inftantly add eight times their quantity of warm water. Let the liquor boil for a little on the fire, ftirring it at the fame time; then let it reft till the heat be fomewhat diminifhed; after which ftrain it through linen: the carbonate of magnefia will remain upon the cloth, and it is to be wafhed with pure water till it become altogether void of faline tafte.

MAGNESIA ALBA. *Lond. Dub.*
White Magnefia.

Take of
Vitriolated magnefia,
Prepared kali, each two pounds;
Diftilled water, boiling twenty pints.

Diffolve the vitriolated magnefia and prepared kali feparately, each in ten pints of water, and filter through paper; then mix them. Boil the liquor a little while, and ftrain it whilft hot through linen, (ftretched fo as to fit it for collecting the magnefia, *Dub.*) upon which will remain the white magnefia; then wafh away, by repeated affufions of diftilled water, the vitriolated kali.

IN this procefs there is a mutual decompofition of the two falts employed. The potafs unites itfelf to the fulphuric acid, while the carbonic acid combines with the magnefia. The large quantity of water ufed is neceffary for the folution of the fulphate of potafs formed; and the boiling is indifpenfably requifite for the expulfion of a portion of carbonic acid, which retains a part of the magnefia in folution; 100 parts of cryftallized carbonate of potafs are fufficient for the decompofition of 125 parts of fulphate of magnefia; and from thefe quantities about 45 parts of carbonate of magnefia are obtained.

The ablutions fhould be made with very pure water; for nicer purpofes diftilled water may be ufed, and foft water is in every cafe neceffary. Hard water for this procefs is peculiarly inadmiffible, as the principle in waters, giving the property called *hardnefs*, is generally a falt of lime, which decompofes the carbonate of magnefia, by compound affinity, giving rife to carbonate of lime, while the magnefia unites itfelf to the acid of the calcareous falt, by which the quantity of the carbonate is not only leffened, but is rendered impure by the admixture of carbonate of lime. Another fource of impurity is the filica, which the fubcarbonate of potafs generally contains. It is moft eafily got rid of by expofing the alkaline folution to the air for feveral days before it is ufed. In proportion as it becomes faturated with carbonic acid, the filica is precipitated, and may be feparated by filtration.

In the preparation of the carbonate of magnefia, the Berlin

college order carbonate of ſoda to be uſed, which has the advantage of forming with the ſulphuric acid of the ſulphate of magneſia, a much more ſoluble ſalt than the ſulphate of potaſs. But the carbonate of magneſia of commerce is prepared from the muriate of magneſia, which remains in ſolution after the cryſtallization of muriate of ſoda from ſea-water.

The carbonate of magneſia thus prepared is a very light, white, opaque ſubſtance, without ſmell or taſte, efferveſcing with acids. It is not, however, ſaturated with carbonic acid. By decompoſing ſulphate of magneſia by an alkaline carbonate, without the application of heat, carbonate of magneſia is gradually depoſited in tranſparent, brilliant, hexagonal cryſtals, terminated by an oblique hexagonal plane, and ſoluble in about 480 times its weight of water. The cryſtallized carbonate of magneſia conſiſts of 50 acid, 25 magneſia, and 25 water; the ſub-carbonate conſiſts of 48 acid, 40 magneſia, and 12 water; and the carbonate of commerce of 34 acid, 45 magneſia, and 21 water. It is decompoſed by all the acids, potaſs, ſoda, baryta, lime, and ſtrontia, the ſulphate, phoſphate, nitrate, and muriate of alumina, and the ſuperphoſphate of lime.

Medical uſe.—Carbonate of magneſia is principally given to correct acidity of the ſtomach, and in theſe caſes to act as a purgative; for ſolutions of magneſia in all acids are bitter and purgative; while thoſe of the other earths are more or leſs auſtere and aſtringent. A large doſe of magneſia, if the ſtomach contain no acid to diſſolve it, neither purges nor produces any ſenſible effect: a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures ſeveral ſtools; whereas the common abſorbents, in the ſame circumſtances, inſtead of looſening, bind the belly. When the carbonate of magneſia meets with an acid in the ſtomach, there is extricated a conſiderable quantity of carbonic acid gas, which ſometimes cauſes uneaſy diſtention of the ſtomach, and the ſymptoms of flatulence. In ſuch caſes, therefore, magneſia is preferable to its carbonate; but on other occaſions, as in nauſea and vomiting, good effects ariſe from the action of the gas evolved.

Off. prep.—Magneſia, *Ed. Lond. Dub.*

ALUMINIS PURIFICATIO. *Lond.*

Purification of Alum.

Take of

Alum, one pound;
Chalk, one drachm;
Diſtilled water, one pint.

Boil them a little, ſtrain, and ſet the liquor aſide to cryſtallize.

THIS procefs is fcarcely neceffary; for the alum of commerce is fufficiently pure for every purpofe; and we apprehend that the addition of the chalk is unchemical, as its only effect will be to decompofe part of the alum, without contributing to the purity of the reft.

SULPHAS ALUMINÆ EXSICCATUS; olim, ALUMEN USTUM. *Edin.*
Dried Sulphate of Alumina, formerly *Burnt Alum.*

Melt alum in an earthen or iron veffel, and keep it over the fire until it ceafe to boil.

ALUMEN USTUM. *Lond. Dub.*
Burnt Alum.

Take of
Alum, half a pound. (Any quantity, *Dub.*)
Burn it in an earthen veffel as long as it boils.

Mr. CHAPTAL found that by exficcation in a red heat, alum of his own manufacture loft 0.67; Roman alum 0.50; Englifh alum 0.47, and Levant alum only 0.40. Thefe differences arife principally from different proportions of water of cryftallization, but alfo from an excefs of alumina, which the laft contains.

According to Kirwan, cryftallized alum confifts of 17.66 acid, 12. alumina, and 70.24 water, and alum deficcated at 700° of 36.25 acid, and 63.75 bafis, by which it would appear that at that heat it lofes not only all its water, but alfo more than half its acid.

Dried alum is only applied externally as a gentle efcharotic to fungous ulcers.

CHAP. V.

METALLINE PREPARATIONS,

ANTIMONY.

SULPHURETUM ANTIMONII PRÆPARATUM; olim, ANTIMONIUM PRÆPARATUM. *Edin.* ANTIMONIUM PRÆPARATUM. *Lond.*
Prepared Sulphuret of Antimony, formerly *Prepared Antimony.*

Sulphuret of antimony is prepared in the fame way as carbonate of lime.

STIBIUM PRÆPARATUM. *Dub.*
Prepared Antimony.

It is reduced to powder, and the impalpable particles, which are to be kept for uſe, are procured in the manner directed for the preparation of crabs claws.

By reducing the ſulphuret of antimony to the ſtate of an impalpable powder, it is both rendered much more active than it would otherwiſe be, and it is prevented from irritating the ſtomach mechanically, of which there would be ſome danger from the ſharpneſs of its ſpiculæ. Even in this ſtate, however, it is not a very certain remedy. In general, it operates as a very mild ſudorific or cathartic; but ſometimes, if it meet with much acid in the ſtomach, it becomes more active, producing vomiting or hypercatharſis. Therefore, it ſeems prudent to evacuate the primæ viæ before it be exhibited, and to combine it with an abſorbent earth.

It is principally given in ſcrofula, glandular obſtructions, cutaneous diſeaſes and rheumatiſm. Its doſe is from 10 to 30 grains and upwards; and it is beſt exhibited in the form of a powder or bolus.

OXIDUM ANTIMONII CUM SULPHURE, PER NITRATEM POTASSÆ; olim, CROCUS ANTIMONII. *Edin.*
Oxide of Antimony, with Sulphur, by Nitrate of Potaſs, formerly *Crocus of Antimony.*

Take of
Sulphuret of antimony,
Nitrate of potaſs, equal weights.

After they are ſeparately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, the reddiſh matter is to be ſeparated from the whitiſh cruſt, and reduced to powder, which is to be edulcorated by repeated waſhings with hot water, till the water come off inſipid.

CROCUS ANTIMONII. *Lond.* STIBIUM NITRO-CALCINATUM. *Dub.*
Crocus of Antimony. Antimony Calcined by Nitre.

Take of
Antimony, powdered,
Nitre, powdered; of each one pound;
Sea ſalt, one ounce.

Mix, and inject them by degrees into a red-hot crucible, and melt

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them, having augmented the heat. Pour out the melted matter, and, when cold, ſeparate it from the ſcoriæ.

In this proceſs, the nitric acid of the nitre, and part of the ſulphuret, are mutually decompoſed: the ſulphur is acidified, and combines with the potaſs of the nitre, while the antimony is converted into protoxide, which combines with the undecompoſed portion of the ſulphuret, and forms a dark brown, opaque, vitrified maſs; ſo that after the ſcoriæ and other ſaline matters have been removed by waſhing, the ſubſtance which remains, according to Prouſt, conſiſts of three parts of oxide of antimony, and one of ſulphuret of antimony.

With regard to the mode of preparation, Bergmann obſerves, that by the common proceſs of throwing the mixture into an ignited uncovered crucible, there is ſometimes a loſs of nearly one half, and therefore adviſes the mixture to be put into a cold crucible, which is to be covered and heated till the matter melts, by which means there is very little loſs.

What is kept in the ſhops, is almoſt univerſally prepared with leſs nitre than is here ordered. The conſequence is, that too much ſulphur remains not acidified, the antimony is ſcarcely oxidized, and the preparation is unfit for the uſes to which it ought to be applied. When nitre has been thus culpably economized, the crocus has a ſteel grey, inſtead of a liver brown colour. The addition of common ſalt, directed by the London and Dublin colleges, is improper, as it is decompoſed, and a portion of muriate of antimony is formed.

The ſulphuretted oxide of antimony is a very uncertain preparation, often operating with very great violence. Its internal uſe is therefore almoſt proſcribed, or at leaſt confined to manical caſes, and veterinary practice. It is, however, uſeful in pharmacy, as the baſis of other preparations.

OXIDUM ANTIMONII, CUM SULPHURE, VITRIFICATUM; olim VITRUM ANTIMONII. *Ed.*

Vitrified Oxide of Antimony with Sulphur, formerly *Glaſs of Antimony.*

Strew ſulphuret of antimony beat into a coarſe powder like ſand, upon a ſhallow unglazed earthen veſſel, and apply a gentle heat underneath, that the antimony may be heated ſlowly: keeping it at the ſame time continually ſtirring, to prevent it from runing into lumps. White vapours of a ſulphureous ſmell will ariſe from it. When they ceaſe with the degree of heat firſt applied, increaſe the fire a little, ſo that vapours may again ariſe; go on in this manner, till the powder, when brought to

a red heat, exhales no more vapours. Melt this powder in a crucible with an intenſe heat, till it aſſumes the appearance of melted glaſs; then pour it out on a heated braſs plate.

ANTIMONIUM VITRIFICATUM. *Lond.*
Vitrified Antimony.

Take of
Powdered antimony, four ounces.
Calcine it in a broad earthen veſſel with fire gradually raiſed, ſtirring it with an iron rod until it no longer emit ſmoke. Put this powder into a crucible, ſo as to fill two thirds of it. A cover being fitted on, make a fire under it, at firſt moderate, afterwards ſtronger, until the matter be melted. Pour out the melted glaſs.

GLASS of antimony, according to Prouſt, conſiſts of one part of ſulphuret of antimony, combined with eight of oxide of antimony; now, by this proceſs, the greateſt part of the antimony is deprived of its ſulphur, and is at the ſame time converted into the protoxide, which combines with the ſmall portion of ſulphuret which remains undecompoſed. But as this preparation is not eaſily made in the manner here directed, unleſs in a furnace conſtructed on purpoſe, apothecaries may advantageouſly adopt the ſynthetical method of Bergmann, which conſiſts in melting in a crucible, with one twelfth or eighth of its weight of ſulphur, protoxide of antimony prepared by deflagrating it with more than twice its weight of nitre. At the temperature neceſſary for melting it, the protoxide of antimony loſes great part of its oxygen, and is converted into ſulphuret and protoxide, in the proportions which form the glaſs of antimony. From our preſent knowledge of the compoſition of this ſubſtance it might be named oxidum antimonii cum ſulphureto.

In whichever way prepared, the glaſs of antimony is tranſparent, and has a fine hyacinthine colour. On diſſolving it in muriatic acid, it gives out ſulphuretted hydrogen gas. Its medical operation is ſo uncertain, that it is only uſed in making other preparations.

OXIDUM ANTIMONII VITRIFICATUM, CUM CERA; olim, VITRUM ANTIMONII CERATUM. *Ed.*
Vitrified Oxide of Antimony with Wax; formerly, *Cerated Glaſs of Antimony.*

Take of
Yellow wax, one part;
Vitrified oxide of antimony, with ſulphur, eight parts.
Melt the wax in an iron veſſel, and throw into it the powdered

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oxide: roaſt the mixture over a gentle fire for a quarter of an hour, continually ſtirring it; then pour it out, and when cold grind it into powder.

The glaſs melts in the wax with a very gentle heat: after it has been about twenty minutes on the fire, it begins t change t colour, and in ten more comes near to that of Scottiſh ſnuff; which is a mark of its being ſufficiently prepared; the mixture loſes about one ninth of its weight in the proceſs.

This medicine was for ſome time much eſteemed in dyſenteries. The doſe is from two or three grains to twenty, according to the age and ſtrength of the patient. In its operation, it makes ſome perſons ſick, and vomit; it purges almoſt every one; though it has ſometimes effected a cure without occaſioning any evacuation or ſickneſs. It is now, however, much leſs uſed than formerly.

SULPHUR STIBIATUM FUSCUM; olim, KERMES MINERALIS. *Dub.*

Brown Antimoniated Sulphur; formerly, *Kermes Mineral.*

Take of
- Prepared antimony,
- Mild vegetable alkali, each one ounce.

Melt them together in a crucible, and when cold reduce the ſubſtance to powder. Put this into a matraſs with five pounds of pure water, and boil for an hour. Then remove the veſſel from the fire; let it ſtand at reſt for a little, and as ſoon as the liquor becomes clear, pour it cautiouſly from the ſediment. When the liquor grows cool, the brown antimoniated ſulphur will ſeparate, which is to be dried on paper.

According to Thenard, the brown precipitate conſiſts of

72.760	brown oxide of antimony.
20.298	ſulphuretted hydrogen.
4.156	ſulphur.
2.786	water and loſs.
100.	

He conſiders kermes mineral, therefore, as a ſulphuretted hydroguret of antimony, eſpecially as it differs from that which is prepared by the direct combination of its conſtituents, only in containing a ſmall quantity of ſuperabundant ſulphur.

When the ſulphuret of antimony and carbonate of potaſs are

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melted together, the carbonic acid is expelled with effervescence, and a ſulphuret of potaſs and antimony is formed. On boiling this in water, water is decompoſed, the antimony is oxidized, and the hydrogen combines with the ſulphur. The ſulphuretted hydrogen thus formed, combines partly with the potaſs, and partly with the oxide of antimony. Now, the ſulphuretted hydroguret of antimony, (kermes mineral), is ſoluble in a ſolution of ſulphuret hydroguretted of potaſs, at 212°, but not at ordinary temperatures. Therefore, on cooling, it ſeparates and falls to the bottom.

Such is the preſent theory of the formation of kermes mineral. With regard to the practice, the directions of the Dublin college differ conſiderably, eſpecially in the proportions of the ſubſtances employed, from the beſt pharmaceutical writers on the Continent. Lemery melted ſixteen parts of ſulphuret of antimony, and one of ſulphur, with eight parts of carbonate of potaſs. The laſt edition of the Pruſſian pharmacopœia directs two parts of ſulphuret of antimony, and one of exſiccated carbonate of ſoda, to be melted, and afterwards boiled fifteen minutes in ſix or eight parts of water, which on cooling depoſits a conſiderable quantity of kermes. The fluid from which the kermes has been depoſited may be again boiled in the reſiduum of the firſt decoction, and it will diſſolve a freſh portion of kermes; and this proceſs may be repeated as long as there remains any to diſſolve. After this, the reſiduum, when melted, conſiſts almoſt ſolely of antimony. It therefore ſeems, that the alkali renders almoſt all the ſulphur ſoluble, and only diſpoſes the oxidizement of as much antimony as is capable of combining with the ſulphuretted hydrogen. There appears to be no reaſon why the whole of the antimony ſhould not be converted into kermes by employing a proper addition of ſulphur and alkali,

Kermes is alſo made in the humid way. Fourcroy boils, in twenty parts of water, ſix parts of pure potaſs of commerce, and into the boiling ſolution throws about the twentieth part of the weight of the alkali, or 0.3 of a part of powdered ſulphuret of antimony, and continues the boiling for ſeven or eight minutes, then filters, and allows the kermes to precipitate by cooling. Hermbſtadt uſes very different proportions; for he boils twelve parts of ſulphuret of antimony, and three of ſalt of tartar, in ninety-ſix parts of water, down to ſixty-four, and then filters, &c. Gren employs four parts of ſulphuret of antimony, ſixteen of carbonate of potaſs, and ſixty-four of water, and boils for ſeveral hours. Göttling boils eight parts of ſulphuret of antimony, and two of ſulphur in a ſufficient quantity of ſolution of potaſs down to one half.

Medical use.—This preparation of antimony is lefs ufed in Britain than on the Continent. It is an active fubftance, and apt to excite vomiting. To adults, the dofe is a grain, or a grain and a half.

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Edin.* SULPHUR ANT. PRÆCIP. *Lond.* SULPHUR STIBIATUM RUFUM. *Dub.*

Precipitated Sulphuret of Antimony. Precipitated Sulphur of Antimony. Orange Antimoniated Sulphur.

Take of
Water of potafs, four pounds;
Water, three pounds;
Prepared Sulphuret of antimony, two pounds.

Boil them, in a covered iron pot, over a flow fire for three hours, adding more water, if neceffary, and frequently ftirring the mixture with an iron fpatula: ftrain the liquor while warm through a double cloth, and add to it when filtered
Diluted fulphuric acid as much
as is neceffary to precipitate the fulphuret, which muft be well wafhed with warm water.

THIS is alfo, according to the analyfis of Thenard, a fulphuretted hydroguret of antimony, which confifts of

68.3	orange oxide of antimony.
17.877	fulphuretted hydrogen.
12.	fulphur.
98.177	

Thenard confiders the fulphur as only mechanically and accidentally mixed; and that the effential difference between this preparation and kermes mineral confifts in the degree of oxidizement of the antimony.

But notwithftanding the great celebrity of Thenard as a chemift, and his having paid particular attention to the combinations of antimony, we may be allowed to doubt the accuracy of his opinion, for it muft appear to every one an affected refinement of analyfis, to difcover in fuch fubftances a difference of only 2 *per cent.* of oxidizement; and as Prouft has fince fhewn that both preparations contain the protoxide, the only difference between thefe bodies appears to be the proportion of fulphur they contain. For it is agreeable to analogy to fuppofe, that the fulphuretted hydroguret of antimony is more foluble in a folution of hydrogu-

retted ſulphuret of potaſs at 212° than at 60°. Therefore, as a boiling ſolution cools, that portion of the ſulphuretted hydroguret of antimony, which it is unable to retain in ſolution at a reduced temperature, ſeparates and forms the red precipitate, known by the name of kermes mineral; but the portion which remains in ſolution, can only be obtained by decompoſing the hydroguretted ſulphuret of potaſs itſelf, by means of an acid: and therefore the precipitate forming the ſulphur auratum antimonii, is a mixture or compound of hydroguretted ſulphuret of antimony, (kermes mineral) with the ſulphur of the decompoſed ſulphuret of potaſs, which gives it a brighter and paler colour.

The precipitated ſulphuret of antimony, like the kermes, may be prepared either in the dry or in the moiſt way. The latter is the mode adopted by the Britiſh colleges, and alſo ſeems to be the moſt univerſally employed on the Continent. Göttling boils two parts of ſulphuret of antimony, and three of ſulphur, in a ſufficient quantity of a recent ſolution of potaſs, filters the ſolution, and precipitates with ſulphuric acid, diluted with twelve times its weight of water. The Pruſſian college uſe equal parts of ſulphuret of antimony and of ſulphur. Wiegleb treats in the ſame manner two parts of ſulphuret of antimony with one of ſulphur. But to his proportions it has been objected, that the product reſembles kermes more than ſulphur auratum. If this objection be juſt, it muſt apply in a ſtill ſtronger degree to the formula of the Britiſh colleges, in which no ſulphur is added.

In the dry way, two parts of ſulphuret of antimony and three of ſulphur may be melted with five or ſix of pure carbonate of potaſs in a covered crucible, as quickly as poſſible, poured into an iron mortar, reduced to powder, and diſſolved by boiling the powder in water. The ſolution is to be filtered warm, diluted with a ſufficient quantity of water, and precipitated by dilute ſulphuric acid. By ſome, the ſolution is allowed to remain at reſt for twenty-four hours before it be filtered, and ſome precipitate by nitrous acid.

The proceſſes for making the golden ſulphuret of antimony, depend on the property which the hydroguretted ſulphuret of potaſs poſſeſſes, of diſſolving, and retaining diſſolved, even at ordinary temperatures, a portion of orange oxide of antimony; and as the attraction by which potaſs exiſts in this compound is weaker than its affinity for acids, on the addition of any acid, the potaſs unites with the acid; a portion of ſulphuretted hydrogen gas eſcapes; and the oxide of antimony, combined with the reſt of the ſulphur and hydrogen, are precipitated in the form of a light orange powder. When the acid is added gradually, the proportion of oxide of antimony always decreaſes, while that of the ſulphur increaſes in each ſucceſſive portion of precipitate. Hence

in the old manner of preparing this ſubſtance from the ſcoriæ, formed in reducing antimony from its ſulphuret, and which contained but little ſulphur, the two firſt portions of precipitate, being dark coloured, were rejected, and only the product of the third precipitation retained for uſe. The want of economy in this proceſs is ſufficiently obvious, as well as the very great improvement in modern times, of adding a ſufficient quantity of ſulphur, and precipitating the whole at once.

Medical uſe.—In its action on the body, the orange ſulphuret of antimony coincides with the kermes mineral; but on account of the larger proportion of ſulphur, it muſt be given in ſomewhat larger doſes.

Off. prep.—Pil. ſtibii comp. *Dub.*

MURIAS ANTIMONII. *Edin.* ANTIM. MURIATUM. *Lond.* STIBIUM MURIATUM CAUSTICUM. *Dub.*

Muriate of Antimony. Muriated Antimony. Cauſtic Muriated Antimony.

Take of
Oxide of antimony with ſulphur, by nitrate of potaſs,
Sulphuric acid, each one pound;
Dried muriate of ſoda, two pounds.

Pour the ſulphuric acid into a retort, gradually adding the muriate of ſoda and oxide of antimony previouſly mixed. Then perform the diſtillation in a ſand-bath. Expoſe the diſtilled matter for ſeveral days to the air, that it may deliqueſce, and then pour the liquid part from the feces.

MURIATE of antimony was originally prepared by diſtilling ſulphuret of antimony with muriate of quickſilver. Muriate of antimony, or butter of antimony, as it was called from its appearance when recently prepared, paſſes over into the receiver, and black ſulphuret of quickſilver remains in the retort, or, by increaſing the heat, red ſulphuret of mercury, which, when obtained by this proceſs, was formerly termed Cinnabar of antimony, is ſublimed. But this mode of preparation is both expenſive and dangerous to the health of the operator. To avoid theſe inconveniencies, Scheele prepared a ſulphuretted oxide of antimony, by deflagrating two parts of ſulphuret of antimony with three of nitrate of potaſs in an iron mortar. The maſs thus obtained is to be powdered, and one pound of it put into a glaſs veſſel, on which is to be poured firſt a mixture of three pounds of water and fifteen ounces of ſulphuric acid, and afterwards fifteen ounces of powdered common ſalt. The whole is to be digeſted for twelve hours, and ſtirred all the while, and the ſolution, when cool, ſtrained through linen. On the reſiduum one third of the above menſtruum

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be poured, and the mixture digefted and ftrained. When diluted with boiling water, a copious precipitate of fubmuriate of antimony takes place from the decompofition of the muriate, while the other falts contained in the folution are not affected by it. Mr. Stott fays, that the digeftion need not be continued longer than two or three hours, and that the heat muft be kept moderate, as the muriate of antimony begins to evaporate before it boils. This procefs furnifhes an eafy, if not the beft, mode of preparing the fubmuriate of antimony, but it does not give us the folution of the muriate in a ftate of purity. In confequence, however, of its volatility, we may eafily feparate it from the other falts by diftillation. This was firft propofed by Gmelin, and improved by Wiegleb, who diftilled a mixture of one part of fulphuret of antimony, four of muriate of foda, and three of fulphuric acid diluted with two of water; but in this procefs, the product is rendered impure by the admixture of fulphur, and there is great danger of the veffels burfting from the immenfe quantity of fulphuretted hydrogen gas difengaged. In 1781, the procefs adopted by the Britifh colleges was firft introduced in the London Pharmacopœia. The Pruffian Difpenfatory pours upon two ounces of crocus of antimony, and fix of dried muriate of foda, introduced into a retort, four ounces of fulphuric acid previoufly diluted with two ounces of diftilled water, and diftill. But we have already obferved, that the oxide of antimony made ufe of in this preparation, is feldom fufficiently oxidized or deprived of its fulphur, which occafions the production of much fulphuretted hydrogen gas, and from the concentrated ftate in which the materials are employed, the muriatic acid gas is fometimes difengaged, efpecially if the heat be improperly applied, fo rapidly, that it has not time to act upon the oxide of antimony. At laft, in 1797, Göttling, by fubftituting the glafs of antimony for the crocus, diluting the fulphuric acid, and ufing the muriate of foda cryftallized, removed thefe inconveniencies. He introduces into a retort a mixture of four ounces of glafs of antimony in powder, with fixteen of muriate of foda, and then pours into it twelve ounces of fulphuric acid, diluted with eight of water. He lutes on a tubulated receiver with gypfum, and diftils to drynefs in a fand-bath, with a heat gradually increafed. By this procefs, he fays, about twenty ounces of very ftrong fuming folution of muriate of antimony are obtained. The refiduum in the retort is fulphate of foda, but unfit for internal ufe, on account of its being mixed with fome antimony.

Muriate of antimony is cryftallizable. It is remarkably deliquefcent, and forms a permanent folution; but if more than a certain proportion of water be added, it is decompofed; a large quantity of fubmuriate of antimony being precipitated, in the

form of white silky crystals, while a super-muriate remains in solution. Muriate of antimony has been said by Dr. Thomson to contain the peroxide, but besides the well known solubility of the oxide and sub-muriate prepared from it, in tartaric acid, an additional proof that it contains the protoxide occurred to myself in the rapid effervescence of hydrogen gas which takes place when zinc is immersed in it.

CALX STIBII PRÆCIPITATA. *Dub.*
Precipitated Calx of Antimony.

Take of
  Mild vegetable alkali,
  Caustic muriated antimony, each eight ounces;
  Water, forty pounds.

Dissolve the vegetable alkali in the water, and to the filtered liquor add the caustic muriated antimony. Dry the calx which subsides, after washing away the saline matters.

This process is intended to separate the protoxide contained in the muriate of antimony, by means of the superior affinity which potass possesses for muriatic acid. It is absolutely necessary that the muriate of antimony be poured into the alkaline solution, and not the solution into the muriate; for the muriate is partially decomposed by water alone, which combines with part of the acid; and the salt, brought to the state of an insoluble submuriate, is precipitated. Therefore, if we pour the alkaline solution into the muriate of antimony, the muriate acts first upon the alkali, and immediately afterwards upon the water of each portion of the solution; and therefore we obtain a mixed precipitate of oxide of antimony and submuriate of antimony. But if we pour the muriate into the alkaline solution, the whole acid of each portion of the muriate immediately finds a sufficient quantity of alkali to saturate it, and the whole, or at least a much larger proportion of the antimony, is precipitated in the state of oxide.

OXIDUM ANTIMONII CUM PHOSPHATE CALCIS; olim, PULVIS ANTIMONIALIS. *Ed.* PULVIS ANTIMONIALIS. *Lond.* PULVIS STIBIATUS. *Dub.*
Oxide of Antimony with Phosphate of Lime, Antimonial Powder.

Take of
  Sulphuret of antimony, in coarse powder,
  Shavings of hartshorn, equal weights.

Mix, and put them into a wide red-hot iron pot, and stir the mixture constantly, until it be burnt into a matter of a grey colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible

another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

THIS is supposed to be nearly the same with the celebrated nostrum of Dr. James, the composition of which was ascertained by Dr. Pearson of London, to whom we are also indebted for the above formula.

By burning sulphuret of antimony and shavings of hartshorn in a white heat, the sulphur is entirely expelled, and the antimony is oxidized, while the gelatine of the hartshorn is destroyed, and nothing is left but phosphate of lime, combined with a little lime. Therefore, the mass which results is a mixture of oxide of antimony and phosphate of lime, which corresponds, at least as to the nature of the ingredients, with James's powder, which, by Dr. Pearson's analysis, was found to consist of 43 phosphate of lime, and 57 oxide of antimony. M. Pully also analysed some James's powder, and found it composed of protoxide of antimony 37, phosphate of lime 21, sulphate of potass 24, and potass combined with protoxide of antimony 18. On which occasion M. Cadet, ignorant that even quack-medicines wereoften imitated and adulterated, accuses Dr. Pearson of having sanctioned with his name a false analysis, in order to conceal a secret so profitable to his country! Mr. Chenevix, by considering the uncertainty of the application, and the precarious nature of the agency, of fire, by which means a variable portion of the oxide of antimony may be volatilized, and that which remains may be oxidized in various degrees, proposes to prepare a substitute for James's powder, by dissolving together equal weights of submurate of antimony and of phosphate of lime in the smallest possible quantity of muriatic acid, and then pouring this solution gradually into water sufficiently alkalized with ammonia. For the reason mentioned in the preceding article, it is absolutely necessary that the muriatic solution be poured into the alkaline liquor. By an opposite mode of procedure, the precipitate would contain more antimony at first, and towards the end, the phosphate of lime would be predominant, and the antimony would be partly in the state of a submuriate. The phosphate of lime is most conveniently obtained pure by dissolving calcined bone in muriatic acid, and by precipitating it by ammonia. If the ammonia be quite free from carbonic acid, no muriate of lime is decomposed. Mr. Chenevix also found, that his precipitate is entirely soluble in every acid which can dissolve either phosphate of lime or oxide of antimony separately, and that about 0.28 of James's powder, and at an average 0.44 of the pulvis antimonialis of the London Pharmacopœia resist the action of every acid.

We have here another proof of the utility of pharmaceutic names descriptive of the nature of the substance; for the pulvis stibiatus of Berlin is a mixture of the antimon. calcinat. *Lond.* with twice its weight of sulphate and nitrate of potass.

Med. use.—The oxide of antimony with phosphate of lime, howsoever prepared, is one of the best antimonials we possess. It is given as a diaphoretic in febrile diseases, in doses of from three to eight grains, repeated every third or fourth hour. In larger quantities, it operates as a purgative or emetic. From its being insoluble in water, it must be given either in the form of a powder, or made into a pill or bolus.

TARTRIS ANTIMONII; olim, TARTARUS EMETICUS. *Ed.*
ANTIMONIUM TARTARISATUM. *Lond.*
Tartrite of Antimony; formerly, *Tartar Emetic. Tartarized Antimony.*

Take of
Oxide of antimony with sulphur, by nitrate of potass, three parts;
Super-tartrite of potass, four parts;
Distilled water, thirty-two parts;
Boil in a glass-vessel for a quarter of an hour, strain through paper, and set aside the strained liquor to crystallize.

TARTARUM STIBIATUM. *Dub.*
Antimoniated Tartar.

Take of
The precipitated calx of antimony, two ounces;
Crystals of tartar, in very minute powder, four ounces;
Distilled water, five pounds.
Boil until the powders be dissolved, and strain the liquor when cold through paper; then having thrown away the salt which remains upon the paper, crystallize by evaporation and slow refrigeration. The crystals should have a regular figure.

THE tartaric acid is capable of combining, in many examples, with two bases at the same time, forming with them triple crystallizable salts. In the present instance, it is combined with oxide of antimony and potass; and as the potass is essential to its constitution, and the real tartrate of antimony is a different salt, its name should certainly have been Tartrate of Antimony and Potass.

In the preparation of this salt, the different combinations of protoxide of antimony have been employed. Any of them will afford a very pure salt. The crocus, precipitated oxide, submuriate, and glass, are all occasionally employed. The London and

Edinburgh colleges uſe the crocus. To this the principal objection is, that it is never found in the ſhops in a ſtate fit for this purpoſe. The Dublin college uſe the precipitated oxide, which anſwers extremely well, but is too expenſive to be generally adopted. The ſubmuriate, which is more eaſily prepared, is juſt as good; for the muriatic acid is completely ſeparated by part of the potaſs, and remains in the mother water. Mr. Stott thinks muriatic acid eſſential to the conſtitution of good tartar emetic, and ſays, that he could never obtain it in tranſparent cryſtals, when he employed the glaſs or crocus, or any other oxide of antimony than the pulvis algerothi. He therefore concludes, that tartar emetic is a quadruple ſalt, conſiſting of oxide of antimony, with muriatic acid, rendered ſoluble by acid of tartar, combined with an under proportion of potaſs, and takes the opportunity of remarking, that he has not found a name in the new nomenclature expreſſive of its conſtituent parts. Such an aſſertion is eaſily made; but I can only ſay, that I have repeatedly prepared tartar emetic perfectly colourleſs, and in very large and beautiful cryſtals, both with the crocus and glaſs; and that therefore muriatic acid, if ever preſent, muſt always be conſidered as an impurity. The glaſs is perhaps the leaſt objectionable of any, and is recommended by Göttling. It always, however, contains about 0.1 of ſilica. The quantity of water employed muſt be ſufficient to diſſolve the tartar emetic formed. The time during which the ebullition is to be continued, is ſtated differently by different pharmaceutiſts. No harm can ariſe from continuing it longer than is abſolutely neceſſary; but it is certainly a waſte of time and fuel to protract it for hours. But the circumſtance which renders the tartar emetic moſt variable in its effects, is the mode of cryſtallization. Some evaporate it to dryneſs; others to a pellicle, and ſet it aſide to cryſtallize; and others again cryſtallize by ſlow evaporation. On account of the ſilica which is combined with the oxide of antimony, and which, being held in ſolution by the potaſs, impedes the cryſtallization, and varies the nature of the product, Vauquelin recommends that the ſolution be firſt evaporated to dryneſs, and that the ſaline maſs obtained ſhould be rediſſolved in boiling water, and then cryſtallized; for, towards the end of the firſt evaporation, the ſilica ſeparates, and becomes totally inſoluble. In this way, he ſays, that we obtain both a purer ſalt, and in larger quantity. If we employ an exceſs of ſupertartrate of potaſs, part of it will remain undecompoſed, and will cryſtallize before or along with the tartar emetic. This ſource of impurity is eaſily avoided, by uſing an exceſs of the antimonial oxide, which remaining undiſſolved, occaſions no error, and prevents the neceſſity of throwing away, as the Dublin college direct,

the cryſtals which form on the filtering paper, if the ſolution be ſaturated.

The primitive form of the cryſtals of tartrate of antimony and potaſs ſeems to be the regular tetrahedron, but it aſſumes a variety of ſecondary forms. It has a ſtyptic metallic taſte. It is ſoluble in three times its weight of water at 212°, and in fifteen at 60°. As this ſtatement of its ſolubility is very different from that of moſt writers, from Bergmann to Fourcroy, who ſay that it requires 80 parts of water at 60°, and ſomewhat leſs than 40 of boiling water, it is neceſſary to mention, that it was aſcertained by careful experiment, with very fine cryſtals of tartar-emetic, more than half an inch in length, and perfectly free from the admixture of any foreign ſalt. The cryſtals, by expoſure to the air, become white and opaque, but do not readily fall to powder. The property of deliqueſcing aſcribed to them by Göttling, muſt have ariſen from the preſence of other ſalts, as he does not prepare his tartar-emetic by cryſtallization, but by evaporating the ſolution to dryneſs. The ſolution of tartar-emetic ſlightly reddens tincture of turnſol. It is decompoſed by acids, alkalies, alkaline carbonates, ſulphuretted hydrogen and its compounds, vegetable juices, decoctions, and infuſions, and many of the metals. According to Thenard, it conſiſts of tartrate of antimony 54, tartrate of potaſs 34, water 8, and loſs 4; or, oxide of antimony 38, tartaric acid 34, potaſs 16, water and loſs 12; and by eſtimation from the analyſis of tartrate of potaſs, and ſuper-tartrate of potaſs, by the ſame chemiſt, it appears, that to ſaturate 38 parts of protoxide of antimony, 70.4 of ſuper-tartrate of potaſs are neceſſary: the whole of the ſuperfluous acid, being 16, combines with the oxide, while 34 of the tartrate of potaſs combine with the tartrate of antimony thus formed, and 20.4 of tartrate of potaſs remain in ſolution in the mother water.

We have been thus particular in our account of the preparation and chemical properties of tartar-emetic, becauſe it is not only of all the preparations of antimony the moſt certain in its operation, but is almoſt indiſpenſable for the ſucceſsful practice of medicine.

Medical uſe.—In doſes of from one to three grains it operates as an emetic, and ſometimes as a carthartic. In ſmaller doſes, it excites nauſea, and proves a powerful diaphoretic and expectorant. As an emetic it is chiefly given in the beginning of fevers and febrile diſeaſes, in chincough, and, in general, whenever we wiſh to evacuate the ſtomach quickly. When great debility is preſent, and in the advanced ſtages of typhoid fever, its uſe is improper, and even ſometimes fatal. As a diaphoretic it is given in ſmall doſes, of from an eighth to a quarter of a grain; and as an expectorant in doſes ſtill ſmaller.

The only proper form for exhibiting it is in solution; and as the intensity of its action on the body is liable to variation, from differences in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting; and at longer intervals, if we only wish it to act on the skin or lungs.

VINUM TARTRITIS ANTIMONII; olim, VINUM ANTIMONIALE. *Ed.*

Wine of Tartrate of Antimony, formerly *Antimonial Wine.*

Take of
Tartrite of antimony, twenty-four grains;
Spanish white wine, one pound.
Mix them so that the tartrite of antimony may be dissolved.

VINUM TARTARI STIBIATI. *Dub.* VINUM ANT. TARTAR, *Lond.*

Wine of Antimoniated Tartar. *Wine of Tartarized Antimony.*

Take of
Antimoniated tartar, ten grains; *Dub.* Two scruples, *Lond.*
Distilled water, boiling hot, half an ounce; *Dub.* Two ounces, *Lond.*
Spanish white wine, two ounces; *Dub.* Eight ounces; *Lond.*
Dissolve the antimoniated tartar in the water, and then add the wine.

VINUM ANTIMONII. *Lond.*

Wine of Antimony.

Take of
Vitrified antimony, in powder, one ounce;
Spanish white wine, a pint and a half.
Digest them for twelve days, agitating them frequently, and strain through paper.

ALL these are solutions of tartrate of antimony and potass in wine; for, in the last instance, a portion of the glass of antimony is dissolved by the super-tartrate of potass contained in the wine; and as the quantity of this is variable, so also the quantity of oxide of antimony dissolved varies: and therefore the preparation ought to be entirely rejected, since its strength can never be known. It is also to be regretted, that the strength of the solutions of tartrate-emetic in wine, as prescribed by the different colleges, is not uniform. According to the Edinburgh college, one ounce of the solution contains two grains of tartar-emetic, while the same quantity, according to the other colleges, contains four grains.

In its employments and effects, the vinous folution of tartar-emetic does not differ from one made with water.

ANTIMONIUM CALCINATUM. *Lond.*
Calcined Antimony.

Take of
- Antimony, powdered, eight ounces;
- Nitre, powdered, two pounds.

Mix them, and project the mixture by degrees into a red hot crucible. Burn the white matter about half an hour; and, when cold, powder it; after which wafh it with diftilled water.

On touching the ignited crucible, this mixture deflagrates with a lively white flame; the antimony is oxidized to the maximum, the fulphur is acidified, and the nitre is decompofed and reduced to its bafe. The product of this deflagration is a lemon-coloured, fcorified mafs, which, after being wafhed with water, leaves the greater part of the oxide of antimony united to about a fifth of its weight of potafs; while the remainder of the oxide, combined with a much larger proportion of potafs, is diffolved in the water, along with the fulphate of potafs formed, and a fmall quantity of nitre which has efcaped decompofition. The peroxide of antimony obtained by this procefs contains about 0.30 oxygen, is fcarcely acted upon by acids, and is capable of forming, with the alkalies, cryftallizable compounds, enjoying a determinate degree of folubility. It may therefore be confidered as nearly approaching to the ftate of an acid; and the infoluble refiduum of this procefs might be named fuper-antimonite of potafs, and the diffolved portion, from its different proportions, antimonite of potafs.

The Pruffian Difpenfatory directs it to be wafhed in ten times its weight of diftilled water, and diluted fulphuric acid to be added until the predominant alkali be faturated, that the oxide of antimony combined with it may be precipitated. The whole powder is then to be well wafhed.

This is a preparation of no very great activity. It formerly bore the name of Diaphoretic antimony, from its fuppofed effect; but even that was doubted: and fince the introduction of James's powder into general ufe, it has not been much employed. It may be given in dofes of from five grains to half a drachm.

CHAP. VI.

SILVER.

NITRAS ARGENTI; olim, Causticum Lunare. *Ed.* Argentum Nitratum. *Dub.*
Nitrate of Silver. Nitrated Silver, formerly *Lunar Caustic.*

Take of
Pureſt ſilver, flatted into plates, and cut in pieces, four ounces;
Diluted nitrous acid, eight ounces;
Diſtilled water, four ounces.

Diſſolve the ſilver in a phial with a gentle heat, and evaporate the ſolution to dryneſs. Then put the maſs into a large crucible, and place it on the fire, which ſhould at firſt be gentle, and afterward increaſed by degrees tlll the maſs flows like oil; then pour it into iron-pipes, previouſly heated and anointed with tallow. Laſtly, keep it in a glaſs veſſel well ſhut.

Argentum Nitratum. *Lond.*
Nitrated Silver.

Take of
Silver, one ounce;
Diluted nitrous acid, four ounces.

Diſſolve the ſilver in the diluted nitrous acid, in a glaſs-veſſel, over warm ſand; then dry it by gently increaſing the heat; afterwards melt it in a crucible, taking care that the heat be not too great, and pour it into proper forms.

The only difference between theſe formulæ is in the proportion of acid employed. The Edinburgh and Dublin colleges uſe equal weights of ſilver and acid. The London college uſe double the quantity of acid. The fact is, that nitrous aeid is capable of diſſolving more than half its weight of ſilver. Therefore, in the one caſe, a portion of ſilver will be left undiſſolved; and, in the other, there will be an exceſs of acid, which, however, will be expelled by the heat neceſſary to bring the ſalt to a ſtate of dryneſs. During the ſolution the metal is oxidized by the decompoſition of part of the acid, while the nitrous gas diſengaged at firſt diſſolves in the acid, and gives it a green colour, which, however, diſappears when the heat is increaſed ſo as to expel the gas. The acid employed muſt be very pure. If it contain, as the acid of commerce always does, ſulphuric or muriatic acid, theſe re-act upon

the nitrate as ſoon as it is formed, and a white precipitate, conſiſting of ſulphate and muriate of ſilver, falls to the bottom.

The method which the refiners employ for examining the purity of their aquafortis (the name they give to dilute nitrous acid), and purifying it if neceſſary, is to let fall into it a few drops of a ſolution of nitrate of ſilver already made: if the liquor remain clear, and grow not in the leaſt turbid or whitiſh, it is fit for uſe; otherwiſe, they add a ſmall quantity more of the ſolution, which immediately turns the whole of a milky white colour; the mixture being then ſuffered to reſt for ſome time, depoſites a white ſediment, from which it is cautiouſly decanted, examined again, and, if neceſſary, farther purified by a freſh addition of this ſolution.

It is neceſſary to employ very pure water in this proceſs, for the muriates and earthy ſalts which common water generally contain, precipitate part of the ſilver in a ſtate of a muriate or oxide. If diſtilled water be not uſed, the water ſhould be added to the acid before it be tried and purified by the nitrate of ſilver.

The ſolution will go on the more ſpeedily, if the ſilver, flatted into thin plates, be rolled looſely up, ſo that the ſeveral ſurfaces do not touch each other. By this management, a greater extent of the ſurface is expoſed to the action of the menſtruum, than when the plates are cut in pieces and laid above each other. If the ſilver be alloyed with copper, the ſolution will have a permanent greeniſh blue colour, and acquire a bright blue on the addition of ammonia. If it contain gold, the gold is not diſſolved, but is found at the bottom of the ſolution, in the form of a black or deep purple powder.

The crucible ought to be of ſilver or porcelain; as, with the common crucibles, the loſs ariſing from the nitrate of ſilver ſinking into their ſubſtance is too great. It ought alſo to be large enough to hold five or ſix times the quantity of the dry matter; for it bubbles and ſwells up greatly, ſo as otherwiſe to be apt to run over. During this time, alſo, little drops are now and then ſpirted up, whoſe cauſticity is increaſed by their heat, againſt which the operator ought therefore to be on his guard. The fire muſt be kept moderate till this ebullition ceaſes, and till the matter becomes conſiſtent in the heat that made it boil before: when the fire is to be quickly increaſed, till the matter flows thin at the bottom like oil, on which it is to be immediately poured into the mould; for if the heat be continued after this, the nitrate of ſilver begins to be decompoſed, and the ſilver is reduced.

In want of a proper iron mould, one may be formed in a maſs of tempered tobacco pipe clay, not too moiſt, by making, with a ſmooth ſtick, previouſly greaſed, as many holes as there is occaſion for: pour the liquid matter into theſe cavities, and when

congealed take it out by breaking the mould. Each piece is to be wiped clean from the greafe, and wrapt up in foft dry paper, not only to keep the air from acting upon them, but likewife to prevent their corroding or difcolouring the fingers in handling.

Nitrate of filver is cryftallizable. Its cryftals are brilliant plates, having a variable number of fides. Their tafte is auftere, and intenfely bitter. They are very foluble in water, but permanent in the air, and not deliquefcent. They are decompofed by heat, light, phofphorus, charcoal, many metals, all the alkalies and earths, fulphuric, muriatic, phofphoric and fluoric acids, and by the falts they form. When deprived of water, and melted according to the directions of the colleges, it forms a black or dark grey coloured mafs, which, when broken, appears to confift of radii, diverging from the centre. It is not deliquefcent when free from copper, which is feldom the cafe. It may, however, be prepared perfectly pure, even from a folution containing copper, by evaporating and cryftallizing it as long as it furnifhes firm tabular cryftals. Thefe are then to be wafhed with a little diftilled water, and melted with a gentle heat. The nitrate of copper remains in the mother water, from which the filver it contains, may be precipitated by muriatic acid.

Medical ufe.—A ftrong folution of nitrate of filver corrodes and decompofes animal fubftances; in a more diluted ftate it ftains them of an indelible black; and for this purpofe it is now ufed as an indelible marking ink. The fufed nitrate of filver is the ftrongeft and moft manageable cauftic we poffefs, and is employed to remove fungous excrefcences, callous edges, warts, ftrictures in the urethra, and the like. It is alfo ufed to deftroy the venereal poifon in chancres, before it has acted on the fyftem. A weak folution of it may be applied as a ftimulus to indolent ulcers, or injected into fiftulous fores.

Notwithftanding its caufticity, it has been given internally. Boerhave, Boyle, and others, commend it highly in hydropic cafes. The former affures us, that made into pills with crumb of bread and a little fugar, and taken on an empty ftomach (fome warm water fweetened with honey being drank immediately after) it purges gently without griping, and brings away a large quantity of water, almoft without the patient's perceiving it: that it kills worms, and cures many inveterate ulcerous diforders. He neverthelefs cautions againft ufing it too freely, or in too large a dofe; and obferves, that it always proves corrofive and weakening to the ftomach.

It has been more recently employed, and with fuccefs, in epilepfy and angina pectoris. On account of its very great activity, each pill fhould not contain above one-eighth or one-fourth of a grain.

CHAP. VII.

COPPER.

ÆRUGO PRÆPARATA. *Dub.*
Prepared Verdegris.

Let the verdegris be ground to powder, and the minute particles be ſeparated in the manner directed for the preparation of crabs claws.

Lond.

Verdegris is to be prepared as other ſubſtances not ſoluble in water.

The intention of this proceſs is merely to obtain the ſub-acetate of copper in the ſtate of the moſt minute mechanical diviſion.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.*

SOLUTIO SULPHATIS CUPRI COMPOSITA; olim, AQUA STYPTICA. *Ed.*
Compound Solution of Sulphate of Copper, formerly *Styptic Water.*

Take of
Sulphate of copper,
Sulphate of alumina, each three ounces;
Water, two pounds;
Diluted ſulphuric acid, an ounce and a half.

Boil the ſulphates in the water to diſſolve them, and then add the acid to the liquor filtered through paper.

In this preparation, the ſubſtances diſſolved in the water exert no chemical action on each other, and the compoſition was probably contrived from the falſe idea, that the ſum of the powers of ſubſtances having ſimilar virtues, was increaſed by mixing them with each other.

Medical uſe—It is chiefly uſed as a ſtyptic for ſtopping bleedings at the noſe; and for this purpoſe, cloths or doſſils, ſteeped in the liquor, are to be applied to the part.

AMMONIARETUM CUPRI; olim, CUPRUM AMMONIACUM. *Ed.*
Ammoniaret of Copper, formerly *Ammoniacal Copper.*

Take of
Pureſt ſulphate of copper, two parts;
Carbonate of ammonia, three parts.
Rub them carefully together in a glaſs mortar, until, after the efferveſcence has entirely ceaſed, they unite into a violet-coloured maſs, which muſt be wrapped up in blotting paper, and firſt dried on a chalk ſtone, and afterwards by a gentle heat. The product muſt be kept in a glaſs phial well cloſed.

CUPRUM AMMONIATUM. *Dub.*
Ammoniated Copper.

Take of
Vitriolated copper, half an ounce;
Mild volatile alkali, an ounce and a half.
Triturate them in a glaſs mortar, until, after the efferveſcence has entirely ceaſed, they unite into a maſs, which is to be wrapped up in bibulous paper, and dried upon a layer of gypſum, placed in warm ſand. It is afterwards to be kept in a phial, cloſed with a glaſs ſtopper.

THE difference between the proportions of the ingredients of this preparation, directed by the two colleges, is very ſtriking. We know of no experiments to aſcertain which of them is moſt correct. It may ſeem ſtrange that directions are given ſo particularly concerning the manner of drying a mixture which is prepared by rubbing two dry ſubſtances together. But ſuch a phenomena is by no means uncommon, and ariſes from the quantity of water of cryſtallization contained in the ingredients being greater than what is required by the new compound formed: as ſoon, therefore, as the ingredients begin to act upon each other, a quantity of water is ſet at liberty, which renders the maſs moiſt.

The nature of this compound, and conſequently the name which ſhould be given it, are not yet ſufficiently aſcertained. Prepared according to the directions of the colleges, it evidently contains oxide of copper, ammonia, and ſulphuric acid. If theſe ſubſtances be chemically combined, it ſhould be denominated the Sulphate or Sub-ſulphate of copper and ammonia. By the expoſure to the air during its exſiccation, and by keeping, it is apt to loſe its blue colour entirely, and become green, and is probably converted into carbonate of copper.

There is another way of preparing this ſubſtance, now directed by the Pruſſian Diſpenſatory, leſs economical indeed, but

more instructive to the student of chemistry, and less liable to variety in the product. Into a solution of sulphate of copper, in three times its weight of distilled water, drop water of ammonia, until the bluish green precipitate, which is formed at first, be redissolved, and the liquor regain its transparency, and become of a beautiful deep blue colour. Concentrate this solution by evaporation to one third, and mix it with about an equal quantity of alcohol, upon which the salt immediately precipitates in silky blue crystals, which are to be collected by filtration, dried, and kept in a phial with a ground-glass stopper.

Ammonia, having a stronger affinity for sulphuric acid than oxide of copper has, separates the oxide, which, being insoluble, is precipitated in the form of a bluish green powder. But as this oxide itself is soluble in ammonia, it is redissolved when more ammonia is added than is sufficient to saturate the acid. Instead of obtaining the compound thus formed in a dry state by evaporation, which would partly decompose it, advantage is taken of its insolubility in alcohol, which, from its more powerful affinity, separates the water of the solution, and precipitates the cupreous salt in silky blue crystals. When a sufficient quantity of alcohol has been employed, it merely abstracts the water of the solution, and precipitates the whole of the saline matter contained in it, which we are therefore disposed to consider as a ternary compound of sulphuric acid, oxide of copper, and ammonia. By drying, this precipitate undergoes some alteration, for it is no longer totally soluble in water. As, however, the solution is easily effected by the addition of ammonia, it would appear that the alteration consists in the decomposition of part of the ammonia.

Medical use.—This preparation has frequently been serviceable at first in epilepsies; but, from its good effects often ceasing after it has been used for some time, frequent want of success and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. It is employed by beginning with doses of half a grain, twice a-day; and increasing them gradually to as much as the stomach will bear. Dr. Cullen sometimes increased the dose to five grains.

LIQUOR CUPRI AMMONIATI; olim, AQUA SAPPHARINA, *Dub.*

Liquor of Ammoniated Copper, formerly, *Sapphire Water.*

Take of

- Lime water, fresh made, eight ounces;
- Sal ammoniac, two scruples;
- Verdegris prepared, four grains.

Mix and digest them for twenty-four hours, then pour off the pure liquor.

AQUA CUPRI AMMONIATI. *Lond.*
Water of Ammoniated Copper.

Take of
 Lime water, one pint;
 Sal ammoniac, one drachm.
Let them ſtand together, in a copper veſſel, till the ammonia be ſaturated.

IN this preparation the lime water decompoſes the muriate of ammonia and forms muriate of lime; while the ammonia diſengaged immediately re-acts upon the oxide of copper contained in the verdegris, and renders it ſoluble. But as the quantity of lime employed is not ſufficient to decompoſe all the muriate of ammonia, the ſolution contains muriate of ammonia, muriate of lime, and ammoniaret of copper, forming probably a triple ſalt, with the acetic acid. The mode of preparing this ſolution, adopted by the London college, is the remains of a fortuitous pharmacy, now juſtly exploded by the other colleges.

Medical uſe.—This compound ſolution is applied externally for cleaning foul ulcers, and diſpoſing them to heal. It has been recommended alſo for taking off ſpecks and films from the eyes; but when uſed with this intention, it ought to be diluted with ſome pure water, as in the degree of ſtrength in which it is here ordered, it irritates and inflames the eyes conſiderably.

CHAP. VIII.

IRON.

FERRI LIMATURA PURIFICATA. *Ed.*
Purified Filings of Iron.

Place a ſieve over the ſilings, and apply a magnet, ſo that the filings may be attracted upwards through the ſieve.

This proceſs does not fulfil the purpoſe for which it is intended. For the adheſion of a very ſmall particle of iron renders braſs and other metals attractable by the magnet. The filings of iron

got from the ſhops of different artificers, which are always mixed with ſolder, and other metals, cannot be purified in this way, ſo as to render them fit for internal uſe; and indeed the only way they can be obtained ſufficiently pure, is by filing a piece of pure iron with a clean file.

Off. prep.—Hydroſulph. ammon. *Ed.*

FERRI OXIDUM NIGRUM PURIFICATUM; olim, FERRI SQUAMÆ PURIFICATÆ. *Edin.*

Purified Black Oxide of Iron, formerly *Purified Scales of Iron.*

Let the ſcales of the oxide of iron, which are to be found at the foot of the blackſmith's anvil, be purified by the application of a magnet. For the magnet will attract only the ſmaller and purer ſcales, and will leave thoſe which are larger and leſs pure.

HERE the application of the magnet is uſeful, bacauſe theſe ſcales contain no foreign metal, but are mixed with earthy and other impurities, which could be ſeparated in no other way. The Pruſſian Diſpenſatory direct this oxide to be prepared by moiſtening the carbonate of iron with olive oil, diſtilling it to dryneſs in a retort, and heating it almoſt to redneſs. The iron in this proceſs is reduced from the ſtate of peroxide to that of protoxide.

CARBONAS FERRI; olim, FERRI RUBIGO. *Ed.*

Carbonate of Iron, formerly *Ruſt of Iron.*

Moiſten purified filings of iron frequently with water, that they may be converted into ruſt, which is to be ground into an impalpable powder.

FERRI RUBIGO. *Lond.*

Ruſt of Iron.

Take of

Iron filings, one pound.

Expoſe theſe to the air, often moiſtening them with water until they be corroded into ruſt; then powder them in an iron mortar, and waſh over with diſtilled water the very fine powder. Moiſten the reſiduum, which is not reduced by moderate triture to a powder, which may be eaſily waſhed over, and expoſe it again to the air; and, laſtly, after having ground it in a mortar, waſh it over. Dry the powder which is waſhed over.

Dub.

Take of

Iron wire, any quantity.

Cut it into pieces, which are to be moiſtened frequently with water, and expoſed to the air until they be corroded into ruſt. Then powder them in an iron mortar, and by pouring water upon them, waſh over the fineſt part of the powder, which is to be dried. The ſame proceſs may be frequently repeated.

Iron is one of the moſt eaſily oxidized of the metals. It is capable of attracting oxygen from the air, and of decompoſing water even in the cold. By expoſure at the ſame time to air and moiſture, it is very quickly oxidized, while it alſo abſorbs carbonic acid, and is converted into a reddiſh brown pulverulent ſubſtance, well known by the name of ruſt of iron. For medical uſe it is prepared as the other ſubſtances inſoluble in water. Apothecaries ſeldom make it themſelves, but obtain it from perſons who manufacture it in large quantities.

Off. prep.—Tinctura ferri muriati. *Lond.*

CARBONAS FERRI PRÆCIPITATUS. *Ed.*

Precipitated Carbonate of Iron.

Take of

Sulphate of iron, four ounces;

Carbonate of ſoda, five ounces;

Water, ten pounds.

Diſſolve the ſulphate in the water, and add the carbonate of ſoda, previouſly diſſolved in a ſufficient quantity of water, and mix them thoroughly.

Waſh the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

On mixing the ſolutions of theſe ſalts together, there is an immediate mutual decompoſition. Sulphate of ſoda is formed, which remains in ſolution, and carbonate of iron, which is precipitated of a green colour. The precipitate when firſt formed, is the carbonate of black oxide of iron, or contains the iron in the ſtate of black oxide, the ſtate in which it exiſts in the green ſulphate of iron; but in the proceſs of drying, it abſorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxide of iron. As the precipitate is extremely light and bulky, it is not eaſily ſeparated by allowing it to ſubſide, and pouring off the clear liquor; filtration ſhould therefore be employed. The carbonate of ſoda is uſed in preference to the carbonate of potaſs, on account of the greater ſolubility of ſulphate of ſoda than of ſulphate of potaſs, which renders the ſubſequent ablution of the ſalt more eaſy.

The carbonate of iron is an excellent and ſafe chalybeate. It may be given in doſes of from five grains to ſixty; but all chalybeates anſwer better in ſmall doſes, frequently repeated, than in large doſes.

AQUA FERRI AËRATI. *Dub.*
Water of Aërated Iron.

It is prepared in the ſame manner as the water of fixed air, by ſuſpending in the water half an ounce of iron wire.

This is a very elegant chalybeate. The iron is in the ſtate of black oxide, and is diſſolved by means of carbonic acid. It was firſt prepared by Bergmann, in imitation of the natural chalybeate waters, and it forms an excellent ſubſtitute for them.

SULPHAS FERRI. *Ed.*
Sulphate of Iron.

Take of
Purified filings of iron, ſix ounces;
Sulphuric acid, eight ounces;
Water, two pounds and a half.

Mix them, and after the efferveſcence ceaſes, digeſt the mixture for ſome time upon warm ſand; then ſtrain the liquor through paper, and after due evaporation ſet it at reſt to cryſtallize.

FERRUM VITRIOLATUM. *Lond.*
Vitriolated Iron.

Take of
Filings of iron,
Vitriolic acid, each eight ounces;
Diſtilled water, three pints.

Mix them in a glaſs veſſel; and, when the efferveſcence has ceaſed, place the mixture for ſome time upon hot ſand; then pour off the liquor, ſtraining it through paper; and, after due evaporation, ſet it aſide to cryſtallize.

FERRUM VITRIOLATUM; olim, SAL MARTIS. *Dub.*
Vitriolated Iron, formerly *Salt of Steel.*

Take of
Iron wire, two ounces.
Vitriolic acid, three ounces and a half;
Water, two pounds.

Mix the acid by degrees with the water in a glaſs veſſel, and gradually add the iron-wire cut into pieces; digeſt the mixture for ſome time, and ſtrain it through paper. Laſtly, ſet aſide the liquor, after due evaporation, to cryſtallize by ſlow refrigeration.

ALTHOUGH the native ſulphate of iron may be purified by ſolution, filtration, and cryſtallization, ſufficiently, for many purpoſes, yet it cannot be procured perfectly pure, except by the direct union of ſulphuric acid and iron; and as it is of conſequence that it ſhould be pure when adminiſtered internally, directions for its preparation have been given by all the colleges. The differences which may be obſerved in the proportions of the materials employed, is of little conſequence, as ſulphuric acid and iron unite only in one proportion.

Iron ſcarcely acts upon ſulphuric acid, unleſs aſſiſted by heat. It then becomes oxidized, by abſtracting oxygen from a portion of the acid, and converting it into ſulphureous acid gas or ſulphur, and combines with the remainder of the acid. But it acts with great rapidity on diluted ſulphuric acid; in which cauſe it is not oxidized at the expence of the acid itſelf, but by decompoſing the water, and therefore the hydrogen of the water is ſeparated in the form of gas. The action of the acid and iron upon each other often ceaſes before the acid is nearly ſaturated, and may be renewed by the addition of a little water. The reaſon is, that all the water which was not decompoſed is employed to diſſolve the ſulphate of iron formed.

The properties and uſes of ſulphate of iron have been already mentioned.

SULPHAS FERRI EXSICCATUS. *Ed.*
Dried Sulphate of Iron.

Take of

Sulphate of iron, any quantity.

Expoſe it to the action of a moderate heat in an unglazed earthen veſſel, until it become white and perfectly dry.

The heat applied here muſt not be ſo great as to decompoſe the ſulphate of iron, but only to deprive it of its water of cryſtallization.

OXIDUM FERRI RUBRUM. *Ed.*
Red Oxide of Iron.

Expoſe dried ſulphate of iron to an intenſe heat, until it is converted into a very red matter.

By the violent heat applied in this preparation, the ſulphate of iron is completely decompoſed, and copious white fumes are expelled. The iron is converted into the red oxide; part of the ſulphuric acid is therefore reduced to the ſtate of ſulphureous acid, and the reſt of the acid is expelled in a very concentrated ſtate. This proceſs was formerly employed in this country, and ſtill is employed in Germany, for the preparation of ſulphuric acid; which, however, from the preſence of the ſulphureous acid, was poſſeſſed of ſome peculiar properties, ſuch as emitting fumes and cryſtallizing. The reſiduum is compoſed of red oxide of iron, combined with a little red ſulphate of iron, which renders it deliqueſcent. To obtain the oxide perfectly pure, the reſiduum muſt therefore be waſhed with water, and dried quickly, to prevent the abſorption of carbonic acid.

Off. prep.—Murias ammoniæ et ferri. *Ed.*

TINCTURA MURIATIS FERRI. *Ed.*
Tincture of Muriate of Iron.

Take of

Purified black oxide of iron in powder three ounces;
Muriatic acid, about ten ounces, or as much as may be ſufficient to diſſolve the powder.

Digeſt by a gentle heat, and after the powder is diſſolved, add of alcohol

As much as will make the whole quantity of liquor amount to two pounds and a half.

TINCTURA FERRI MURIATI. *Lond. Dub.*
Tincture of Muriated Iron.

Take of

The ruſt of iron (iron-wire, *Dub.*) half a pound;
Muriatic acid, three pounds;
Rectified ſpirit of wine, three pints.

Pour the muriatic acid on the ruſt of iron in a glaſs veſſel; and ſhake the mixture now and then during three days. Set it by, that the feces may ſubſide; then pour off the liquor; evaporate this to one pint, and, when cold, add it to the vinous ſpirit.

In making this preparation, each of the colleges uſes iron in a different ſtate; the Dublin college, metallic iron; the Edinburgh, the black oxide; and the London college, the carbonate of the red oxide. There is no difference between the ſolutions of iron and of its black oxide; becauſe the iron is converted into the ſtate of black oxide by the decompoſition of the water, before it is diſſolved; and accordingly, when iron is diſſolved in

muriatic acid, there is a disengagement of hydrogen gas; whereas the black oxide is dissolved without any effervescence. But muriatic acid is capable of combining either with the black or red oxides of iron, and forms with each, salts, having distinctive properties.

The red muriate of iron is not crystallizable; has a dark orange colour; is deliquescent; forms a brown red solution, having a very astringent taste; and is soluble in alcohol. The green muriate is crystallizable; has little colour; is very soluble in water, forming a pale green solution; and is insoluble in alcohol. But the aqueous solution of green muriate attracts oxygen so rapidly from the atmosphere, that unless the access of the air be totally excluded, it is always partially converted into red muriate. The solutions of iron and of its black oxide, are accordingly found always to contain a greater or less proportion of red muriate, and are therefore not uniform or constant in their properties. Besides, as it is only the red muriate which is soluble in alcohol, it appears to us that it is better, according to the directions of the London college, to use the red carbonate of iron, by which means we obtain an unmixed and permanent solution of the red muriate. Muriate of iron is also formed, when we dissolve the sulphuret of iron in muriatic acid for the purpose of procuring sulphuretted hydrogen gas. It is also the residuum which remains in the retort after the sublimation of muriate of ammonia and iron.

When well prepared, the alcoholic solution of muriate of iron has a yellowish colour, and very astringent taste. It is an excellent chalybeate, and may be given in doses of ten or twenty drops twice or thrice a-day, in any proper vehicle.

MURIAS AMMONIÆ ET FERRI; olim, FLORES MARTIALES. *Edin.*

Muriate of Ammonia and Iron; formerly *Martial Flowers.*

Take of
Red oxide of iron, washed and again dried;
Muriate of ammonia, equal weights;
Mix them thoroughly, and sublime.

FERRUM AMMONIACALE. *Lond.*

Ammoniacal Iron.

Take of
Iron filings, one pound;
Sal ammoniac, two pounds.
Mix and sublime. What remains at the bottom of the vessel mix by rubbing together with the sublimed matter, and sublime a second time.

Although at a low temperature ammonia decomposes the muriate of iron, at a high temperature iron and its oxides decompose muriate of ammonia. But as muriate of ammonia is itself a volatile salt, great part of it escapes undecomposed; so that the product is a mixture of muriate of ammonia with red muriate of iron. According to the formula of the Edinburgh college, the decomposition is effected by simple affinity. As soon as the oxide of iron acts on the muriate of ammonia, the ammonia which is separated comes over: then as the heat increases, undecomposed muriate of ammonia is sublimed; which, as the process advances, is mixed with an increasing proportion of muriate of iron. In the process of the London college, the decomposition is more complex; and a considerable quantity of hydrogen gas is produced. Both colleges employ a much larger quantity of iron than is necessary. According to the German pharmaceutists, if the iron be equal to one sixteenth of the muriate of ammonia, it is sufficient. The new Prussian Dispensatory directs one ounce of iron to be dissolved in a mixture of two parts of muriatic acid, and one of nitrous acid; this solution of red muriate of iron to be mixed with twelve ounces of muriate of ammonia, and the whole evaporated to dryness; and the dry mass to be sublimed in a wide necked retort, with a heat increased to redness.

Whatever process be employed, the heat must be applied as quickly as possible; and the sublimed product thoroughly mixed by trituration, and kept in well-stopt glass vessels. It should have a deep orange colour, and a smell resembling saffron, and should deliquesce in the air.

This preparation is supposed to be highly aperient and attenuating; though no otherwise so than the rest of the chalybeates, or at most only by virtue of the saline matter joined to the iron. It has been found of service in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity, and weakness of the solids, as the rickets. From two or three grains to ten may be conveniently taken in the form of a bolus.

TINCTURA FERRI AMONIACALIS. *Lond.*

Tincture of Ammonical Iron.

Take of

Ammoniacal iron, four ounces;

Proof-spirit, one pint.

Digest and strain.

This is merely a spiritous solution of the preceding article, and is a much less elegant medicine than the simple tincture of muriate of iron.

FERRUM TARTARISATUM. *Lond.*
Tartarized Iron.

Take of
- Filings of iron, one pound;
- Cryſtals of tartar, in powder, two pounds.

Mix them with diſtilled water into a thick maſs, which is to be expoſed to the action of the air for eight days in a wide glaſs veſſel; then grind the matter, after being dried in a ſand bath to a very minute powder.

This is in fact a triple tartrate of iron and potaſs, the exceſs of acid in the ſuper-tartrate of potaſs being ſaturated by oxide of iron. The iron is oxidized during the firſt part of the proceſs, in which it is moiſtened and expoſed to the action of the air.

Tartrate of potaſs and iron may alſo be formed, by boiling a ſolution of ſuper-tartrate of potaſs with iron, or, what is ſtill better, with ſome of the oxides of iron, until the exceſs of acid be ſaturated. The compound, according to Thenard, is very ſoluble, varies in colour according to the ſtate of the oxide; cryſtallizes in ſmall needles, and has a chalybeate taſte. It is not precipitated by alkalies or alkaline carbonates. It is decompoſed by ſulphuretted hydrogen and its compounds, and by gallic acid. The editors of Gren's Pharmacy ſay, that a ſolution of iron in ſuper-tartrate of potaſs, furniſhes by evaporation greeniſh ſpathoſe permanent cryſtals, difficultly ſoluble; which is ſurely a miſtake; at leaſt it neither correſponds with Thenard's account, nor with the old name of this preparation, Mars Solubilis.

The tartrate of iron and potaſs may be given in the form of powder or bolus, in doſes of from ten to thirty grains.

VINUM FERRI. *Lond.*
Wine of Iron.

Take of
- Iron filings, four ounces;
- Spaniſh white wine, four pints.

Digeſt for a month, often ſhaking the veſſel, and then ſtrain.

VINUM FERRATUM; olim, VINUM CHALYBEATUM. *Dub.*
Ironated Wine, formerly *Chalybeate Wine.*

Take of
- Iron wire cut in pieces, four ounces;
- White Rheniſh wine, four pints.

Digeſt for a month, often ſhaking the veſſel, and then ſtrain.

This is merely a ſolution of the preceding article in wine; for the iron is only diſſolved in the wine by means of the ſuper-tartrate of potaſs it contains. The Rheniſh wine directed by the Dublin college, will, therefore, diſſolve a larger quantity of iron than the Spaniſh white wine of the London college. But a ſolution of a known proportion of the preceding article in wine, will give a medicine of more equal powers, and may be made extemporaneouſly.

The doſe is from a drachm to half an ounce, repeated twice or thrice a-day in chlorotic caſes.

TINCTURA FERRI ACETATI. *Dub.*

Tincture of Acetated Iron.

Take of
- Acetated vegetable alkali,
- Vitriolated iron, each one ounce;
- Alcohol, two pounds.

Rub the acetated alkali and vitriolated iron together in a glaſs mortar, until the maſs deliqueſces; then add, during the trituration, the alcohol, and ſtrain the ſolution.

The acetate of potaſs and ſulphate of iron decompoſe each other, and form acetate of iron, and ſulphate of potaſs. But as the ſulphate of potaſs is not ſoluble in alcohol, the ſolution, after filtration, is an alcoholic ſolution of acetate of iron. The acetic acid is alſo capable of combining with both oxides of iron; and as the iron in the ſulphate is in the ſtate of black oxide, which has a ſtrong attraction for oxygen, it is probable that the acetate prepared in the way directed is a mixed acetate.

It has an extremely ſtyptic taſte, and is given in doſes of thirty or forty drops.

CHAP. IX.

MERCURY.

HYDRARGYRUM PURIFICATUM. *Dub.*
Purified Quickſilver.

Take of
Quickſilver, ſix pounds.
Draw off four pounds by ſlow diſtillation.

HYDRARGYRUS PURIFICATUS. *Lond.*
Purified Quickſilver.

Take of
Quickſilver,
Iron-filings, each four pounds.
Rub them together, and diſtil from an iron-veſſel.

Edin.

Take of
Quickſilver, four parts;
Filings of iron, one part.
Rub them together, and diſtil from an iron-veſſel.

THE quickſilver of commerce is often adulterated with lead, tin, or other metals, which renders it unfit for internal uſe, and for many preparations. It therefore becomes neceſſary to purify it, and fortunately its comparatively great volatility ſupplies us with an eaſy proceſs. The Dublin college diſtil it ſimply without any addition; but, leſt towards the end of the proceſs the mercury ſhould elevate any impurities along with it, they draw off but two thirds. The principal objection to this proceſs is the want of economy; for although the remaining third may be uſed for ſome purpoſes, its value is very much depreciated. As iron has a much ſtronger affinity for almoſt all the ſubſtances with which quickſilver may be adulterated than quickſilver has, by adding iron-filings we may draw off the whole quickſilver by diſtillation, without any fear of the impurities riſing along with it. The London college add an equal weight of iron-filings, but ſo large a quantity cauſes the ſize of the diſtilling apparatus to be unneceſſarily increaſed. The Edinburgh college uſe one fourth, which is certainly enough.

Glaſs-retorts are inadmiſſible in this diſtillation; becauſe, when the mercury begins to boil, the concuſſion is ſo great, that they would certainly be broken. Iron-retorts are the beſt, although ſtrong earthen ones may be alſo uſed. The receiver may be of the ſame materials, or of glaſs, if we wiſh to inſpect the progreſs of the operation; but in this caſe we muſt interpoſe an adopter between the retort and receiver, and fill the receiver nearly full water, that the mercury may not crack it by falling hot into it. The retort employed ſhould be ſo large, that the quickſilver ſhould not fill above one third of it.

ACETIS HYDRARGYRI. *Ed.*
Acetite of Quickſilver.

Take of

Purified quickſilver, three ounces;
Diluted nitrous acid, four ounces and a half, or a little more than may be required for diſſolving the mercury;
Acetite of potaſs, three ounces;
Boiling water, eight pounds.

Mix the quickſilver with the diluted nitrous acid; and after the effervescence has ceaſed, digeſt if neceſſary, with a gentle heat, until the quickſilver be entirely diſſolved. Then diſſolve the acetate of potaſs in the boiling water, and immediately to this ſolution, ſtill hot, add the former, and mix them by agitation. Then ſet the mixture aſide to cryſtallize. Place the cryſtals in a funnel, and waſh them with cold diſtilled water; and, laſtly, dry them with as gentle a heat as poſſible.

HYDRARGYRUS ACETATUS. *Lond.*
Acetated Quickſilver.

Take of

Purified quickſilver,
Diluted nitrous acid, each half a pound;
Acetated kali, three ounces;
Tepid diſtilled water, two pounds.

Mix the quickſilver with the diluted nitrous acid in a glaſs-veſſel, and digeſt them for twenty-four hours with a gentle heat, that the quickſilver may be diſſolved. Pour the nitrated quickſilver thus prepared into the acetated kali, previouſly diſſolved in the tepid (90°) water, that acetated quickſilver may be formed, which is to be firſt waſhed with cold diſtilled water, and afterwards diſſolved in a ſufficient quantity of boiling diſtilled water. Filter this ſolution through paper, and ſet it aſide to cryſtallize.

HYDRARGYRUM ACETATUM. *Dub.*
Acetated Quickſilver.

Take of
Purified quickſilver,
Diluted nitrous acid, each half a pound;
Acetated vegetable alkali, three ounces;
Diſtilled water, heated to about the ninetieth degree, two pounds and a half.

Diſſolve the mercury in the acid with a gentle heat. Mix the liquor, before cryſtals form in it by cooling, with the water in which the acetated vegetable alkali has been previouſly diſſolved. Waſh the precipitate with cold diſtilled water, then pour upon it twenty-four pounds of diſtilled water, and boil a little. Having removed the veſſel from the fire, let it ſtand at reſt for about ten minutes; and, laſtly, pour off from the ſediment the clear liquor, and let the acetated quickſilver cryſtallize in it by ſlow refrigeration.

THESE proceſſes are all fundamentally the ſame. They differ chiefly in the proportions. Thoſe of the Edinburgh college were aſcertained by very careful experiment, and if its directions be accurately followed, the preparation ſucceeds admirably. Nitrate of mercury is decompoſed by acetate of potaſs; and the products are acetate of mercury and nitrate of potaſs. The nitrate of potaſs being much more ſoluble than the acetate of mercury, remains in ſolution after the latter is ſeparated by cryſtallization. Mercury is capable of forming different combinations with nitrous acid, which poſſeſs each their characteriſtic properties. When we employ a ſufficient quantity of acid to diſſolve the mercury without the aſſiſtance of heat, and to retain it in ſolution there is always an exceſs of acid, and therefore it is a ſolution of ſuper-nitrate of mercury. If we evaporate this ſolution very gently, or if we add an additional quantity of mercury, and aſſiſt the action of the acid by a gentle heat, until nitrous gas begins to eſcape, we obtain nitrate of mercury cryſtallized in various forms. In theſe the mercury is in the ſtate of protoxide. But if we aſſiſt the action of the acid by boiling, until nitrous gas ceaſes to eſcape, the mercury is converted into peroxide, and a larger quantity is diſſolved. This ſolution is very apt to cryſtallize, both on cooling, and by the diminution of the quantity of acid during the proceſs; and if we attempt to dilute the ſolution with water, a copious precipitate of ſub-nitrate of mercury immediately takes place; and the ſolution contains ſuper-nitrate of mercury. If the dilution be made with cold water, the ſub-nitrate has a white colour, which, by a very ſlight application of heat, paſſes to a beautiful yellow, the colour which it has at firſt when ſeparated by boiling water.

For making the acetate of mercury, the nitrate is prepared with a very gentle heat, and with excefs of acid, that it may be retained in perfect folution, and that there may be no poffibility of any admixture of fub-nitrate with the acetate formed. A larger proportion of acid is ufed by the Edinburgh college than by the other colleges, but by accurate experiment it was afcertained to be neceffary for the fuccefs of the procefs. In mixing the folutions, we muft be careful to pour the mercurial folution into that of the acetate of potafs, becaufe, by adopting the contrary procedure, the fub-nitrate of mercury will be precipitated undecompofed, if any peroxide be contained in the mercurial folution. For diffolving the acetate of potafs, the London and Dublin colleges only ufe as much water as is capable of retaining the nitrate of potafs in folution; the acetate of mercury is therefore precipitated, and is purified by again diffolving it in boiling water and cryftallizing it. This part of the procefs is fimplified by the Edinburgh college, who ufe as much water for diffolving the acetate of potafs as is capable of retaining, fo long as it is hot, the acetate of mercury in folution, and of allowing it to cryftallize as it cools. In this way, therefore, it is procured at once fufficiently pure. The exficcation of the acetate of mercury is an operation of great delicacy; for it is fo fpongy, that it retains the moifture with great obftinacy; and it is decompofed fo eafily, that heat can fcarcely be employed. It is beft dried by compreffing it between feveral folds of bibulous paper.

The Pruffian Difpenfatory directs acetate of mercury to be prepared by diffolving two ounces of the red oxide of mercury in about feven ounces of concentrated acetic acid, and evaporating the folution to drynefs.

Acetate of mercury is fcarcely foluble in cold water, but diffolves readily in boiling water. It generally cryftallizes in micaceous plates, and is extremely eafy of decompofition.

It is fuppofed to be a mild preparation of mercury, and was the active ingredient of the celebrated Keyfer's pills. In folution it has alfo been recommended externally, to remove freckles and cutaneous eruptions.

MURIAS HYDRARGYRI; olim, MERCURIUS SUBLIMATUS CORROSIVUS. *Ed.* HYDRARGYRUS MURIATUS. *Lond.* HYDRARGYRUM MURIATUM CORROSIVUM. *Dub.*

Muriate of Quickfilver, formerly *Corrofive Sublimate. Muriated Quickfilver. Corrofive Muriated Quickfilver.*

Take of

Purified quickfilver, two pounds;

Sulphuric acid, two pounds and a half;

Dried muriate of ſoda, four pounds.

Boil the quickſilver with the ſulphuric acid in a glaſs veſſel placed in a ſand bath, until the matter be dried, which is to be mixed when cold in a glaſs veſſel, with the muriate of ſoda; then ſublime in a glaſs cucurbit, with a heat gradually increaſed. Laſtly, ſeparate the ſublimed matter from the ſcoriæ.

By boiling the quickſilver to dryneſs with ſulphuric acid, the metal is oxidized by the decompoſition of part of the acid, and combines with the reſt to form ſub-ſulphate of quickſilver. In the ſecond part of the proceſs, this ſub-ſulphate is decompoſed by dried muriate of ſoda, muriate of quickſilver ſublimes, and ſulphate of ſoda remains behind, in Holland it is manufactured by ſubjecting to ſublimation a mixture of dried ſulphate of iron, nitrate of potaſs, muriate of ſoda, and quickſilver. In the former editions of the Edinburgh Pharmacopœia, the mercury was oxidized by boiling to dryneſs in nitrous acid, and then ſublimed with muriate of ſoda and ſulphate of iron. Bergmann recommends the ſublimation of ſub-nitrate of mercury and muriate of ſoda, and Mr. Murray ſeems inclined to prefer it to the new proceſs.

Muriate of quickſilver cryſtallizes by ſublimation in priſmatic needles, forming a white ſemi-tranſparent maſs. It is ponderous. Its taſte is acrid, ſtyptic, and durable. It is ſoluble in 20 parts of cold water, and in 2 at 212°. It is alſo ſoluble in 5.8 parts of alcohol at 70°, and in almoſt an equal weight of boiling alcohol. It gives a green colour to ſyrup of violets. It is not altered by expoſure to the air, and is ſublimed unchanged by heat. It is not decompoſed by any of the acids; but is ſoluble, without alteration, in the ſulphuric, nitric, and muriatic acids. It is precipitated by all the alkalies and earths, of an orange-yellow colour, which gradually changes to a brick red; and by their carbonates, of a permanent yelllow colour. Ammonia forms with it an inſoluble, white, triple ſalt. It is alſo decompoſed by ſeveral of the metals. It conſiſts, according to Mr. Chevenix, N°. 1, and to Mr. Zaboada, N°. 2, of

	N°. 1.	N°. 2.
Quickſilver	69.7	71.5
Oxygen	12.3	8.5

	N°. 1.	N°. 2.
Oxide of mercury	82	80
Muriatic acid	18	20
	100	100

And the oxide thereof confifts of

	N°. 1.	N°. 2.
Quickfilver	85	90
Oxygen	15	10
	100	100

Medical ufe.—Muriate of mercury is one of the moft violent poifons with which we are acquainted. Externally it acts as an efcharotic or a cauftic; and in folution it is ufed for deftroying fungous flefh, and for removing herpetic eruptions; but even externally it muft be ufed with very great caution. It has, however, been recommended to be given internally, by the refpectable authorities of Boerhaave and Van Swieten; and it is the active ingredient of all the empyrical antivenereal fyrups. Were it really capable of curing the venereal difeafe, or equal in efficacy to the common modes of adminiftering mercury, it would poffefs many advantages over them in other refpects: but that it cannot be depended upon, is almoft demonftrated by its ufe as an antivenereal being very much confined to the quacks, and by the teftimony of the moft experienced practitioners. Mr. Pearfon fays, that it will fometimes cure the primary fymptoms of fyphilis, efpecially if it produce confiderable forenefs of the gums, and the common effects of mercury: but that it will often fail in removing a chancre; and where it has removed it, that the moft fteady perfeverance will not fecure the patient from a conftitutional affection. It has on fome occafions, however, a ufeful auxiliary to a mercurial courfe, in quickly bringing the fyftem under the influence of mercury, and in fupporting its action after the ufe of frictions, and it is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the defquamation of eruptions.

Off. prep.—Sub-murias hydrarg. *Ed. Lond. Dub.* Calx. hydr. alba. *Lond*

SUB-MURIAS HYDRARGYRI; olim, CALOMELAS. *Ed.*
Sub-muriate of Quickfilver, formerly *Calomel.*

Take of
Muriate of quickfilver, ground to powder in a glafs-mortar, four ounces;
Purified quickfilver, three ounces.

Rub them together in a glafs-mortar, with a little water, to prevent the acrid powder from rifing, until the mercury be extinguifhed; and having put the powder, after being dried, into an oblong phial, of which it fills only one third, fublime from warm fand. After the fublimation is finifhed, having

broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and fublime the reft of the mafs. Grind this into a very minute powder, which is laftly to be wafhed with boiling diftilled water.

Hydrargyrum Muriatum Mite Sublimatum. *Dub.*
Mild Sublimated Muriated Quickfilver.

Take of
Corrofive muriated mercury, one pound:
Purified quickfilver, nine ounces.

Rub them together until the globules difappear, and fublime. Rub the fublimed matter with the refiduum, and repeat the fublimation. Laftly, wafh the fublimed matter with frequent affufions of boiling diftilled water.

Calomelas. *Lond.*
Calomel.

Take of.
Muriated quickfilver, one pound;
Purified quickfilver, nine ounces;

Rub them together, until the globules difappear and fublime; then rub the whole matter again together and fublime. Repeat the fublimation in the fame manner four times. Afterwards triturate the matter into a very fubtile powder, and wafh it by the affufion of boiling diftilled water.

When quickfilver is triturated with muriate of quickfilver, it abftracts from the oxidized quickfilver of the muriate a part of its oxygen, and the whole mafs affumes a blackifh grey colour. When this is expofed to a degree of heat fufficient to convert it into vapour, the action of the different portions of quickfilver upon each other, and upon the muriatic acid, is much more complete: and the whole is converted into a folid white mafs, confifting of mercury in a ftate of lefs oxidizement, and combined with lefs acid than in the muriate.

The trituration of the muriate of mercury is a very noxious operation, as it is almoft impoffible to prevent the finer particles from rifing and affecting the operator's eyes and noftrils. To leffen this evil, the Edinburgh college direct the addition of a little water. In the fecond part of the procefs, when the heat is applied, a fmall portion of quickfilver and undecompofed muriate firft arife, and condenfe themfelves in the higheft part or neck of the phial; than the fubmuriate rifes, and, being lefs volatile, condenfes in the upper half of the body, while a fmall quantity of quickfilver, in a ftate of confiderable oxidizement, remains fixed,

or near the bottom. The Edinburgh college ſeparate the ſubmuriate from the other matters, and ſublime it again. The other colleges triturate the whole together again, and re-ſublime it, the Dublin college once, the London four times. As in the firſt ſublimation, a portion of the quickſilver and of the muriate of quickſilver always ariſe undecompoſed, a ſecond ſublimation is neceſſary, eſpecially if we triturate the whole products of the firſt ſublimation together; but any further repetition of the proceſs is perfectly uſeleſs. Leſt any portion of muriate ſhould have eſcaped decompoſition, the ſubmuriate muſt be edulcorated with boiling diſtilled water, until the water which comes off forms no precipitate with alkalies.

Submuriate of mercury is generally obtained in the form of a white ſolid maſs; but is capable of cryſtallizing in tetrahedral priſms terminated by pyramids. It has no taſte, and is ſcarcely ſoluble in water or in alcohol. It is leſs volatile than muriate of mercury. It is blackened by light, and becomes brown when triturated with lime water or the alkalies. It is converted by oxymuriatic acid into muriate of quickſilver. According to Mr. Chenevix N°. 1, and to M. Zaboada N°. 2. it conſiſts of

	N°. 1.	N°. 2.
Quickſilver,	79	85
Oxygen,	9.5	4.4

	N°. 1.	N°. 2.
Oxide of quickſilver,	88.5	89.4
Muriatic acid,	11.5	10.6
	100	100

And its oxide contains,

	N°. 1.	N°. 2.
Quickſilver,	89.3	95.
Oxygen,	10.7	5.
	100	100

According to Mr. Chenevix's analyſis, therefore, 54 parts of quickſilver ſeem ſufficient to convert 100 of the muriate into ſubmuriate; but according to Zaboada's 75, which is exactly the proportion directed by the colleges.

Medical uſe.—The ſubmuriate of quickſilver is one of the beſt mercurials we poſſeſs. By proper management it may be made to increaſe, in a remarkable manner, almoſt any of the ſecretions or excretions. One grain mixed with ſugar, and ſnuffed up the noſtrils, is recommended as a powerful errhine in amauroſis. The ſame mixture is blown into the eye, to remove ſpecks from the cornea. Given in doſes of one grain morning and evening, or in larger doſes combined with opium, to prevent it from acting as a purgative, it excites ptyaliſm, In larger doſes

of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with ſudorifics, ſudorific.

It is one of the preparations of mercury which is capable of curing ſyphilis in every form. It alſo produces very powerful and ſalutary effects in obſtructions and chronic inflammations of the viſcera, eſpecially of the liver; and, in general, it is applicable to every caſe in which mercurials are indicated.

Off. prep.—Pulv. ſcam. cum calom. *Lond.* Pulv. ſtibii comp. *Dub.*

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. *Edin.*

Precipitated Sub-muriate of Quickſilver.

Take of
Diluted nitrous acid,
Purified quickſilver, each eight ounces;
Muriate of ſoda, four ounces and a half;
Boiling water, eight pounds.

Mix the quickſilver with the diluted nitrous acid, and towards the end of the effervefcence digeſt with a gentle heat, frequently ſhaking the veſſel in the meantime. But it is neceſſary to add more quickſilver to the acid than it is capable of diſſolving, that a perfectly ſaturated ſolution may be obtained.

Diſſolve at the ſame time the muriate of ſoda in the boiling water, and into this ſolution pour the other while ſtill hot, and mix them quickly by agitation, pour off the ſaline liquor after the precipitate has ſubſided, and waſh the ſub-muriate of quickſilver by repeated affuſions of boiling water, which is to be poured off each time after the depoſition of the ſub-muriate, until the water come off taſteleſs.

HYDRARGYRUS MURIATUS MITIS. *Lond.*

Mild Muriated Quickſilver.

Take of
Purified quickſilver,
Diluted nitrous acid, of each half a pound.

Mix in a glaſs veſſel, and ſet it aſide until the quickſilver be diſſolved. Let them boil, that the nitrated quickſilver may be diſſolved. Pour out the boiling liquor into a glaſs-veſſel, containing another boiling liquor, conſiſting of
Muriatic ſalt, four ounces;
Diſtilled water, eight pints.

After the powder has ſubſided to the bottom of the veſſel, pour off the clear ſupernatant liquor, and waſh the powder which remains behind, till it becomes inſipid, with frequent affuſions of hot water; then dry it on blotting-paper with a gentle heat.

HYDRARGYRUM MURIATUM MITE PRÆCIPITATUM. *Dub.*
Precipitated Mild Muriated Quickſilver.

Take of,

Purified quickſilver, ſix ounces and a half;

Diluted nitrous acid, ſix ounces.

Digeſt in a glaſs veſſel with a moderate heat for ſix hours, occaſionally agitating it. Towards the end of the ſolution, increaſe the heat ſo as to make the liquor boil for a little, which is then to be poured off from the quickſilver remaining undiſſolved, and mixed with ten pounds of boiling water, in which four ounces of common ſalt have been previouſly diſſolved. Waſh the powder which ſubſides to the bottom with warm diſtilled water, as long as the liquor decanted from it is rendered turpid from the addition of a few drops of mild ley.

IN the firſt part of this proceſs, a ſolution of nitrate of quickſilver, with exceſs of oxide, is formed. In the ſecond, there is a mutual decompoſition of this nitrate, and of the muriate of ſoda; nitrate of ſoda is formed, and muriate of quickſilver, with exceſs of oxide. In this preparation, our object is to obtain the inſoluble compound which reſults from the combination of the protoxide of mercury with muriatic acid. In this view, the application of heat in diſſolving the mercury in the nitrous acid, is improper; for a portion at leaſt of the mercury is converted into its peroxide, which occaſions, in the firſt place, the formation of a little ſub-nitrate of mercury, when poured into the ſaline ſolution; and ſecondly, the formation of a quantity of muriate of mercury (corroſive ſublimate) which muſt be waſhed away. Accordingly, Mr. Murray has found much more mild and leſs corroſive muriate of mercury is formed when the ſolution is made ſlowly and in the cold, than when the directions of the colleges are complied with.

When properly prepared, the ſub-muriate obtained by precipitation ſcarcely differs from that obtained by ſublimation. Göttling found no other difference than that the precipitated ſub-muriate became grey, when triturated with lime-water, whereas the ſublimed ſub-muriate becomes black. But he expoſed to heat half an ounce of the precipitated ſub-muriate in a ſubliming apparatus; ſcarcely a grain of a reddiſh matter remained fixed; and the ſublimed matter now became black when triturated with lime-water, and differed in no reſpect from ſub-muriate prepared in the ordinary way by ſublimation. It therefore would ſeem to be an improvement in the proceſs, to ſublime the ſub-muriate after it is precipitated; eſpecially as by that operation it would be moſt effectually ſeparated from any ſub-nitrate which might be mixed with it.

There is ftill another way of preparing the fub-muriate of mercury, without ufing corrofive fublimate, which muft be noticed. Is was contrived by Hermbftaedt, and is recommended by Moench with the confidence derived from experience, as the very beft procefs for preparing the fub-muriate of quickfilver.

Take of
Pure quickfilver, feven ounces and a half;
Sulphuric acid, four ounces;
Dried muriate of foda, five ounces and a half.

Diftil in a glafs-retort the fulphuric acid, with four ounces of the quickfilver, until they be converted into a dry white mafs, Triturate the fulphate of mercury thus formed, with the remaining three ounces and a half of quickfilver, until the globules difappear; then add the muriate of foda; mix them and fublime. As the product of the firft fublimation ftill contains unoxidized quickfilver, it is to be again triturated and fublimed. The fublimate being wafhed, is now pure fub-muriate of quickfilver, and weighs about fix ounces.

The theory of this procefs is the fame with that of the formation of the muriate of quickfilver. The difference between the two products arifes from the proportion of quickfilver being greater, and that of the muriate of foda employed being lefs. We are not prepared to ftate the comparative economy of thefe three proceffes defcribed, for preparing fub-muriate of quickfilver; but of the laft procefs, we may obferve, that according to Mr. Chenevix's analyfis, feven ounces and a half of quickfilver fhould furnifh nine ounces and a half of fub-muriate of quickfilver, and according to M. Zaboada's nearly nine; fo that there is evidently a confiderable lofs, which muft be owing either to the formation of muriate of quickfilver, or of oxide of quickfilver. To diminifh this lofs, we might diffolve the refiduum of the firft fublimation, which is principally fulphate of foda, in the water with which the fublimate was wafhed, and precipitate the folution with carbonate of foda. We fhould thus regain the remaining portion of the quickfilver in the ftate of brown carbonate, which might be applied to many purpofes. The fame thing might be practifed with advantage on the wafhings and refiduums of feveral of the other preparations.

CALX HYDRARGYRI ALBA. *Lond.*
White Calx of Quickfilver.

Take of
Muriated quickfilver,
Sal ammoniac,
Water of prepared kali, each half a pound.

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Diſſolve firſt the ſal ammoniac, afterwards the muriated quickſilver in diſtilled water, and add to theſe the water of prepared kali. Waſh the powder until it become inſipid.

In this preparation the Pruſſian college uſe carbonate of ſoda.

When to a ſolution of muriate of ammonia, there is added muriate of quickſilver, about thirty times more of the latter is diſſolved than the ſame quantity of pure water is capable of diſſolving; and there takes place a conſiderable increaſe of temperature. Now, as theſe facts ſufficiently prove a reciprocal action of the two ſalts, and as there is no decompoſition, it is evident that they muſt have combined to form a triple ſalt; eſpecially as they cannot be again ſeparated either by ſublimation or cryſtallization. This compound may therefore, with propriety, be termed Muriate of Mercury and Ammonia. It is the Sal Alembroth of the alchemiſts. It is very ſoluble in water, and is ſublimed by heat without decompoſition. When to a ſolution of this ſalt we add a ſolution of an alkaline carbonate, there occurs a partial decompoſition. The alkali combines with a portion of the muriatic acid; and reduces the muriate of mercury and ammonia to the ſtate of a ſub-muriate, which, being inſoluble, falls to the bottom of the ſolution.

The ſub-muriate of mercury and ammonia thus precipitated, has at firſt an earthy and afterwards a metallic taſte. It is not ſoluble in water. It is decompoſed by heat; furniſhing water, ammonia, and nitrogen gas, while 0.86 of ſub-muriate of mercury remains behind. Sulphuric and nitric acids partially decompoſe it, and convert it into muriate of mercury, and triple ſalts of mercury and ammonia. Muriatic acid diſſolves it, and converts it into muriate of quickſilver and ammonia. According to Fourcroy's analyſis, it conſiſts of 81 oxide of mercury,
16 muriatic acid,
3 ammonia.
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Therefore, if the analyſis of the different muriates be correct, there is an unneceſſary want of economy in uſing equal parts of muriate of ammonia and muriate of mercury; for by calculation, at leaſt, we ſhould employ only one part of the former to eight of the latter.

It is only uſed for ointments; and its principal recommendation is its fine white colour.

Off. prep.—Ungt. calcis hydrarg. alb. *Lond.*

OXIDUM HYDRARGYRI CINEREM. *Ed.*
Ash-coloured Oxide of Quickſilver.

Take of
Purified quickſilver, four parts;
Diluted nitrous acid, five parts;
Diſtilled water, fifteen parts;
Water of carbonate of ammonia, a ſufficient quantity.

Diſſolve the mercury in the nitrous acid; then gradually add the diſtilled water, and pour into the mixture as much water of the carbonate of ammonia as ſhall be ſufficient to precipitate the whole of the oxide of mercury, which is then to be waſhed with pure water and dried.

PULVIS HYDRARGYRI CINEREUS. *Dub.*
Ash-coloured Powder of Quickſilver.

Take of
Quickſilver, two ounces;
Diluted nitrous acid, two ounces and a half.

Diſſolve the quickſilver with a moderate heat, and dilute the liquor with eight ounces of cold diſtilled water; then drop into it an ounce and a half of the liquor of mild volatile alkali, or as much as may be ſufficient to precipitate the metal, which is to be waſhed with frequent affuſions of warm water, and afterwards dried.

THESE proceſſes, which are eſſentially the ſame, are intended to furniſh a ſubſtitute for the black oxide of quickſilver, on which the efficacy of the mercurials moſt frequently employed, and moſt certainly uſeful, depends. In theſe, the mercury is oxidized by trituration, in contact with the atmoſphere; but this operation is both ſo tedious and troubleſome, that it is often imperfectly performed or aſſiſted by improper means.

In the proceſſes we are now explaining, it was ſuppoſed that as ammonia has a ſtronger affinity for nitric acid than oxide of mercury has, it would ſeparate oxide of mercury from its ſolution in nitric acid; and, therefore, that the precipitate obtained was oxide of mercury ſimilar to that formed by trituration. But ſince the nature of the triple metalline ſalts has been better underſtood, this has been diſcovered to be an error, although the exact mode of their action is not yet explained. The grey precipitate which is formed, may, ſpeaking generally, be called a ſub-nitrate of mercury and ammonia; for it conſiſts of oxide of mercury and ammonia, not ſaturated with nitric acid; but even to ocular inſpection it does not ſeem to be homogeneous; and when it is digeſted in acetic acid, it is partially diſſolved, and the reſiduum re-

quires a very pale, or almoſt white colour. The portion diſſolved ſeems to be black oxide, and the white reſiduum to be pure ſub-nitrate of mercury and ammonia, which, according to Fourcroy, cryſtallizes in brilliant polyhedral cryſtals, without ſmell, of an extremely ſtyptic taſte, ſcarcely ſoluble in water, is decompoſed by heat, by the ſulphuric and muriatic acids, and by lime, potaſs, and ſoda, and conſiſts of 68.20 oxide of mercury, 16 of ammonia, and 15.80 of nitric acid. According to theſe obſervations, this preparation ought not to be called the grey oxide of mercury, and is not identical with the black oxide of mercury, prepared by trituration. If, however, it anſwered the ſame purpoſes, the identity would be of little conſequence; but from its never having been introduced into general uſe, although ſo much more eaſily prepared, we may preſume that it is not equal in point of efficacy.

Black oxide of mercury may however be obtained, according to the direction of Saunders, by triturating with lime water, and ſubſequent edulcoration, the ſublimed ſub-muriate of mercury, or rather the precipitated ſub-muriate, as propoſed by Göttling; and that the decompoſition may be more eaſy and complete, we ſhall venture to ſuggeſt, that for this preparation the latter ſub-muriate ſhould not be dried, but ſhould be triturated with the lime-water as ſoon as it is edulcorated. This ſimple black oxide certainly merits a fair trial.

This oxide is ſaid, however, by M. Braamcamp and Siquiera-Oliva, to be prepared in the greateſt purity by boiling the aſh-coloured oxide of the Edinburgh college, long and violently in water, until the triple ſalt be diſſolved or decompoſed. In this ſtate it conſiſts of mercury 92.5, and oxygen 7.5.

The Pruſſian college direct a black oxide of mercury to be prepared, by mixing four ounces of mercury with ſix ounces of nitrous acid, diluted with two ounces of diſtilled water, and occaſionally agitating them without heat, until the acid be ſaturated. The ſolution is then to be diluted with diſtilled water, and water of cauſtic ammonia to be dropt into it as long as the precipitate formed is black.

Off. prep.—Ungt. oxidi hydrarg, cinerei, *Ed.*

HYDRARGYRUS CUM CRETA *Lond.*

Quickſilver with Chalk.

Take of

Purified quickſilver, three ounces;
Prepared chalk, five ounces.

Triturate them together until the globules diſappear.

QUICKSILVER has a ſtrong affinity for oxygen, and abſorbs it

ſlowly ſrom the atmoſphere. But the combination may be conſiderably accelerated by agitation, and ſtill more by triturating quickſilver with any ſubſtance which promotes its mechanical diviſion, and thus increaſes its ſurface. With this view, quickſilver is triturated with viſcid ſubſtances, as fats, honey, ſyrup, &c. or with pulverulent ſubſtances, as the chalk in the preſent example.

In this ſtate of oxidizement, quickſilver contains about 0.04 of oxygen according to Fourcroy, is ſoluble in acids without the extrication of nitrous gas, and is eaſily reduced by heat, and even by light.

The black oxide is the mildeſt, but at the ſame time the moſt efficacious of the preparations of mercury. Combined with chalk it is not in general uſe; but in the form of the common mercurial pill and ointment, it is more employed than any other preparations of the ſame metal except calomel.

HYDRARGYRUM CALCINATUM. *Dub. Lond.*

Calcined Quickſilver.

Take of

Purified quickſilver, any quantity.

Put it into an open glaſs veſſel, with a narrow mouth and wide bottom. Expoſe this to about the ſix-hundredth degree of heat, until the metal be converted into red ſcales.

This is an extremely tedious, and therefore expenſive, operation, becauſe mercury is incapable of abſorbing from the atmoſphere the quantity of oxygen neceſſary to convert it into the red oxide, except when in the ſtate of vapour. But as the form of a veſſel, which will prevent the diſſipation and loſs of the mercurial vapour, will at the ſame time hinder the free acceſs and frequent renewal of the air, the operation can only proceed ſlowly. The veſſel moſt advantageouſly employed, is a wide, flat-bottomed matraſs, with a very narrow, and almoſt capillary, neck. Only ſo much mercury is introduced into it as will cover the bottom of the matraſs; and the veſſel is not inſerted in the ſand deeper than the mercury ſtands within it. A degree of heat is then applied ſufficient to cauſe a gentle ebullition in the mercury, which is thus alternately converted into vapour, and condenſed again in the upper part of the veſſel. While in the ſtate of vapour, it abſorbs the oxygen of the air contained in the veſſel: by which means it is gradually changed into a black, and then into a red, powder; but a complete converſion into the latter ſtate is not effected in leſs than ſeveral months.

Red oxide of quickſilver thus prepared, conſiſts of ſmall cryſtalline grains, of a deep red colour, and very brilliant ſparkling

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appearance. By heat it may be ſublimed in the form of a beautiful ruby-coloured vitrified ſubſtance. At a red heat it is decompoſed, giving out oxygen gas, while the metal is revived, and is immediately volatilized. It is ſoluble in ſeveral of the acids; and during its ſolution it does not decompoſe them or water. It is eaſily diſoxidized. It contains about 0.1 oxygen.

Med. uſe.—It is not only an acrid ſubſtance, violently purgative and emetic, but even cauſtic and poiſonous. Its internal uſe is proſcribed; but it is applied externally as an eſcharotic, being previouſly triturated to a very fine powder; or it is formed into a ſtimulating ointment with unctuous ſubſtances.

OXIDUM HYDRARGYRI RUBRUM PER ACIDUM NITRICUM; olim MERCURIUS PRÆCIPITATUS RUBER. *Edin.*

Red Oxide of Quickſilver by Nitric Acid, formerly *Red Precipitated Mercury.*

Take of
Purified quickſilver, one pound;
Diluted nitrous acid, ſixteen ounces.

Diſſolve the quickſilver, and evaporate the ſolution, with a gentle heat, to a dry white maſs; which, after being ground into powder, is to be put into a glaſs cucurbit, and to have a thick glaſs plate laid upon its ſurface. Then, having adapted a capital, and placed the veſſel in a ſand bath, apply a gradually increaſed heat, until the matter be converted into very red ſcales.

HYDRARGYRUS NITRATUS RUBER. *Lond.*

Red Nitrated Quickſilver.

Take of
Purified quickſilver,
Nitrous acid, of each one pound;
Muriatic acid, one drachm.

Mix in a glaſs veſſel, and diſſolve the quickſilver in a ſand bath; then raiſe the fire until the matter be converted into red cryſtals.

HYDRARGYRUM SUB-NITRATUM. *Dub.*

Sub-nitrated Quickſilver.

Take of
Purified quickſilver, twenty ounces;
Diluted nitrous acid, twenty-five ounces.

Mix them in a glaſs veſſel, and diſſolve the quickſilver with a moderate heat; then increaſe the fire until the matter be converted into red ſcales.

IN the firſt part of theſe proceſſes a fully ſaturated nitrate of mercury is formed. In the ſecond part, the metal is oxidized to

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the maximum by the decompoſition of the acid. When a ſufficient heat is applied, the nitrate of mercury firſt melts, then exhales nitrous oxide gas, and changes its colour ſucceſſively to yellow, orange, and brilliant purple red. If well prepared, it ſhould have a cryſtalline ſcaly appearance, ſublime entirely at a red heat, and be ſoluble without any reſiduum in nitrous acid. According to Fourcroy, it contains no nitrous acid, unleſs a ſufficient heat has not been applied; but according to moſt other chemiſts it contains ſome nitrous acid; and differs from the red oxide prepared by the action of heat alone, in always being more acrid.

This is an extremely difficult operation, and ſkilful operators not unfrequently fail to obtain it of that brilliant cryſtalline appearance which is eſteemed. M. Payſſe, who paid great attention to this preparation in Holland, where it is manufactured in large quantities, gives the following directions. Diſſolve 100 pounds of pure mercury in 140 of pure nitrous acid of ſp. grav. 1.30 to 1.37, promoting their action by a ſand bath, evaporate by diſtillation, and when the formation of nitrous gas indicates the decompoſition of the nitrate of mercury, remove the receiver, and apply a ſteady and moderate heat for about eight hours, until a match, which has been juſt blown out inflames on being introduced into the matraſs, which is a proof that the operation is finiſhed. To its ſucceſs it is neceſſary, 1, that the nitrous acid be not mixed with muriatic; 2, that it be ſufficiently ſtrong; 3, that the evaporation be conducted with a moderate heat; 4, that the veſſel be ſufficiently large and flat, ſo that a large ſurface be expoſed, and the whole equally heated; 5, that the heat be gradually augmented; and laſtly, that it be ſteadily maintained the whole time. Turf is the fitteſt fuel.

Med. uſe.—It is only uſed as an eſcharotic, and care muſt be taken that it is finely levigated, otherwiſe it only irritates, without deſtroying the parts to which it is applied. It is a very common application to chancres.

Off. prep.—Ungt. oxidi hydrarg. rubri, *Ed.*

SUB-SULPHAS HYDRARGYRI FLAVUS; olim TURPETHUM MINERALE. *Edin.*

Yellow Sub-Sulphate of Quickſilver, formerly *Turpeth Mineral.*

Take of

Purified quickſilver, four ounces;
Sulphuric acid, ſix ounces.

Put them into a glaſs cucurbit, and boil them in a ſand bath to dryneſs. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which muſt be frequently waſhed with warm water.

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HYDRARGYRUS VITRIOLATUS. *Lond.* HYDRARGYRUM SUB-VITRIOLATUM. *Dub.*

Vitriolated Quickſilver. Sub-Vitriolated Quickſilver.

Take of

Purified quickſilver, one pound;

Vitriolic acid, fifteen ounces. (A pound and a half. *Dub.*)

Having mixed them in a glaſs veſſel, heat them by degrees until they unite, and dry the matter completely with a ſtrong fire. This matter, on the affuſion of a large quantity of hot diſtilled water, will immediately become yellow, and fall to powder. Rub the powder with this water in a glaſs mortar. Pour off the water after the powder has ſubſided, and waſh it with diſtilled water till it becomes inſipid, (till, when poured off, it no longer forms any precipitate on the addition of a few drops of mildley. *Dub.*)

THE action of ſulphuric acid on mercury has been examined with conſiderable attention by Fourcroy. In the cold they have no action on each other, but on the application of heat, the ſulphuric acid begins to be decompoſed, ſulphureous acid gas is extricated, and the metal is oxidized, and combines with the undecompoſed acid, forming with it a white ſaline maſs, covered with a colourleſs fluid. In this ſtate it reddens vegetable blues, is acrid and corroſive, does not become yellow by the contact of the air, and is not decompoſed by water either warm or cold. It is therefore ſuper-ſulphate of quickſilver, and the proportion of the acid in exceſs is variable.

By waſhing the ſaline maſs repeatedly with ſmall quantities of water, it is at laſt rendered perfectly neutral. It no longer reddens vegetable blues. It is white; it cryſtallizes in plates, or fine priſmatic needles; it is not very acrid; it is not decompoſed either by cold or boiling water, but is ſoluble in 500 parts of the former, and in about 250 of the latter. It is much more ſoluble in water acidulated with ſulphuric acid. The ſulphate of quickſilver conſiſts

	Fourcroy.	Braamcamp and Sigueira.
Of Quickſilver	75.	57.42
Oxygen	8.	6.38
Sulphuric acid	12.	31.8
Water	5.	4.4
	100.	100.

But if, inſtead of removing the exceſs of acid from the ſuper-ſulphate of quickſilver, by waſhing it with water, we continue

the action of the heat according to the directions of the colleges, there is a copious evolution of sulphureous acid gas, and the saline residuum is converted into a white mass, which therefore evidently contains both a larger proportion of mercury, and in a state of greater oxidizement, than the salt from which it was formed. But this white saline mass is farther analysed by the affusion of hot water; for one portion of it is dissolved, while the remainder assumes the form of a beautiful yellow powder. The portion dissolved is said to contain excess of acid. The yellow powder is, on the contrary, a sub-sulphate.

The sub-sulphate of quicksilver has a bright yellow colour, a considerably acrid taste, is soluble in 2000 parts of cold water, is also soluble in sulphuric acid, slightly diluted, is decomposed by the nitric acid, and forms muriate of quicksilver with the muriatic acid, while the neutral sulphate forms sub-muriate. It oxidizes quicksilver, and is converted by trituration with it into a black powder. At a red heat it gives out oxygen gas, and the metal is revived. It consists

	Fourcroy.	Braamcamp and Sigueira.
Of Quicksilver	76.	75.23
Oxygen	11.	8.47
Sulphuric acid	10.	15.
Water	3.	.3
	100.	100.

Med. use.—It is a strong emetic, and with this intention operates the most powerfully of all the mercurials that can be safely given internally. Its action, however, is not confined to the primæ viæ; it will sometimes excite a salivation, if a purgative be not taken soon after it. It is used chiefly in virulent gonorrhœas, and other venereal cases, where there is a great flux of humours to the parts. But its chief use at present is in swellings of the testicles from a venereal affection; and it seems not only to act as a mercurial, but also, by the severe vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected. It is said likewise to have been employed with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions: the dose is from two grains to six or eight. It may be given in dozes of a grain or two as an alterative and diaphoretic. Dr. Hope, senior, has found, that in doses of one grain, with a little powder of liquorice root, it forms a very convenient errhine.

This medicine was lately recommended as the most effectual preservative against the hydrophobia.

On the whole, however, we consider it as a superfluous preparation, whose place may be more safely supplied by other mercurials or emetics.

SULPHURETUM HYDRARGYRI NIGRUM; olim ÆTHIOPS MINERALIS. *Edin.* HYDRARGYRUS CUM SULPHURE. *Lond.* HYDRARGYRUM SULPHURATUM NIGRUM. *Dub.*
Black Sulphuret of Quicksilver, formerly *Æthiops Mineral.*

Take of
Purified quicksilver,
Sublimed sulphur, each equal weights.
Grind them together in a glass mortar with a glass pestle, till the mercurial globules totally disappear.
(It is also prepared with twice the quantity of quicksilver. *Ed.*)

THIS process, simple as it appears, is not, even in the present advanced state of chemistry, perfectly understood. It was formerly imagined, that the quicksilver was merely mechanically divided, and intimately mixed with the sulphur. But that they are really chemically united, is indisputably proved by the insolubility of the compound in nitrous acid. Fourcroy is of opinion, that during the trituration, the mercury absorbs oxygen, and is converted into the black oxide, and that in this state it is slightly combined with the sulphur. The editors of Gren also suppose it to be in the state of black oxide, but that it is combined with hydroguretted sulphur; and they direct a little water to be added during the trituration, that by its decomposition it may facilitate the process.

The black sulphuret of quicksilver, thus prepared by trituration, has a pulverulent form, is insoluble in nitric acid, is totally soluble in a solution of potass, and is precipitated unchanged from this solution, by acids. It is not altered by exposure to the air; and when heated in an open vessel, it emits sulphureous acid gas, acquires a dark violet colour, and, lastly, sublimes in a brilliant red mass, composed of crystalline needles.

The combination of quicksilver with sulphur may be much more speedily affected by the assistance of heat, by pouring the mercury, previously heated, upon the sulphur in a state of fusion, and stirring them until they cool, and form a consistent mass, which may be afterwards powdered. The sulphuret prepared by fusion, differs, however, from that prepared by trituration; for it is not soluble in a solution of potass, but is converted by long ebullition in it into the red sulphuret, and it

alſo reddens ſpontaneouſly in courſe of time from the action of the air.

Black ſulphuret of mercury may be alſo prepared in the humid way, as it is called, by precipitation, or even by direct ſolution. According to Berthollet, mercury agitated with ſulphuretted hydroguret of ammonia, forms a black ſulphuret exactly reſembling that prepared by trituration; but if hydroguretted ſulphuret of ammonia be uſed, the black precipitate formed gradually aſſumes a red colour, and the ſolution contains ſulphuretted hydroguret of ammonia. The ſame phenomena take place with all the mercurial ſalts.

As a medicine, black ſulphuret of quickſilver poſſeſſes no very conſpicuous effects. It is principally uſed as an alterative in glandular affections, and in cutaneous diſeaſes. It has been commonly given in doſes of from 5 to 10 grains; but even in doſes of ſeveral drachms, and continued for a conſiderable length of time, it has ſcarcely produced any ſenſible effect.

HYDRARGYRUM SULPHURATUM RUBRUM; olim CINNABARIS FACTITIA. *Lond. Dub.*

Red Sulphuretted Quickſilver, formerly *Factitious Cinnabar.*

Take of

Quickſilver purified, forty ounces;

Sulphur, eight ounces.

Mix the quickſilver with the melted ſulphur; and if the mixture takes fire, extinguiſh it by covering the veſſel; afterwards reduce the maſs to powder and ſublime it.

As ſoon as the mercury and ſulphur begin to unite, a conſiderable exploſion frequently happens, and the mixture is very apt to take fire, eſpecially if the proceſs be ſomewhat haſtily conducted. This accident the operator will have previous notice of, from the matter ſwelling up, and growing ſuddenly conſiſtent; as ſoon as this happens, the veſſel muſt be immediately cloſe covered.

During the ſublimation, care muſt be had that the matter do not riſe into the neck of the veſſel, ſo as to block it up and cauſe it to burſt. To prevent this, a wide-necked bolt head, or rather an oval earthen jar, coated, ſhould be choſen for the ſubliming veſſel. If the former be employed, it will be convenient to introduce at times an iron wire, ſomewhat heated, in order to be the better aſſured that the paſſage is not blocking up; the danger of which may be prevented by cautiouſly raiſing the veſſel higher from the fire.

If the ingredients be pure, there is no reſiduum. In ſuch caſes, the ſublimation may be known to be over, by introducing a wire as before, and feeling with it the bottom of the veſſel, which will then be perfectly ſmooth: if any roughneſs or inequalities be perceived, either the mixture was impure, or the ſublimation is not completed; if the latter be the caſe, the wire will ſoon be covered over with the riſing cinnabar.

M. Tuckert and Payſſe have deſcribed, from actual obſervation, the proceſs followed in the manufactory of M. Brand at Amſterdam, where 48000 pounds of cinnabar are annually prepared. 150 pounds of ſulphur are mixed with 1080 pounds of mercury, and expoſed to a moderate heat in a bright iron kettle, one foot deep, and two and a half in diameter. The black ſulphuret of mercury thus produced is reduced to powder, and put up in earthen pots capable of containing about two pints of water. The ſubliming apparatus conſiſts of three large coated crucibles, bound with iron, and ſurmounted with domes of iron, through the top of which the black ſulphuret is introduced, built into a furnace, ſo that two thirds of each apparatus is expoſed to the action of the flame, which circulates freely around them. The fuel made uſe of is turf, which is found preferable to all other, probably from its affording a ſteady and moderate heat. The fire is kindled in the evening, and when the crucibles have become red, the pots containing the black ſulphuret are emptied into them ſucceſſively, at firſt one into each, and afterwards two, three, or more at a time, according to the violence of the inflammation which ſucceeds. Sometimes the flame riſes four, or even ſix feet above the domes; when its violence is a little abated, the aperture is covered cloſely up with a lid of iron. In this manner the whole quantity is introduced into the three crucibles in about thirty-four hours. The fire is ſteadily ſupported in a proper degree for thirty-ſix hours, and the ſublimation aſſiſted by ſtirring the matter every quarter of an hour with a triangle of iron, until the whole is ſublimed, when the fire is allowed to expire. The colour of the flame changes during the proceſs from a dazzling white to a yellow white, orange yellow, blue and yellow, green, violet, and blue and green. When it acquires a fine ſky blue, or indigo colour, and riſes only an inch or two above the aperture, the aperture is cloſed hermetically, and luted with clay and ſand. After the apparatus has cooled, 400 pounds of ſublimed red ſulphuret of mercury are found in each, ſo that there is a loſs of 30 pounds on the 1230 of materials employed. The proceſs by which cinnabar is converted into vermillion is kept a ſecret by the Dutch; but M. Payſſe diſcovered, that by keeping ſome levigated cinnabar in the dark, covered with water, and ſtirred frequently for a month, it acquires the brilliant colour of Chineſe vermilion,

When taken out of the subliming vessels, the red sulphuret of quicksilver is a brilliant crystalline mass, and first acquires its very rich colour when reduced to the form of a fine powder by trituration. It has neither smell nor taste, and is insoluble in water and in alcohol. In close vessels it sublimes entirely unchanged, but requires for this purpose a pretty great degree of heat. It is not soluble in any acid, and is only decomposed by the nitro-muriatic, which dissolves the quicksilver, and separates the sulphur. It is not decomposed by boiling it with solutions of the alkalies, but is decomposed by melting it with potass, soda, lime, iron, lead, copper, antimony, and several other metals. Proust has proved that it consists of eighty-five quicksilver, and fourteen or fourteen and a half sulphur, and that the quicksilver is not oxidized to a maximum, as had been falsely supposed, but is in its metallic state. His analysis is confirmed by the other methods by which cinnabar may be prepared. Thus, the black sulphuret of quicksilver by fusion is converted into the red sulphuret, by boiling it in a solution of potass, which can only act by dissolving the sulphuretted hydrogen and superfluous sulphur. Submuriate, or sub-sulphate of mercury, sublimed with sulphur, furnish red sulphuret of mercury, and muriate, or sulphate, of mercury.

Med. use.—Red sulphuret of quicksilver is sometimes used in fumigations against venereal ulcers in the nose, mouth, and throat. By inhaling the fumes produced by throwing half a drachm of it on red hot iron, a violent salivation has been produced. This effect is by no means owing to the medicine as a sulphuret; for when set on fire, it is no longer such, but mercury resolved into vapour, and blended with the sulphureous acid gas; in which circumstances, this mineral has very powerful effects.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and, in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce a ptyalism rapidly, and great consequent debility, and that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction as if no fumigation had been employed.

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CHAP. X.

LEAD.

ACETIS PLUMBI; olim SACCHARUM SATURNI. *Edin.*
Acetite of Lead; formerly *Sugar of Lead.*

Take of
White oxide of lead, any quantity;
Put it into a cucurbit, and pour upon it of
Diſtilled acetous acid ten times its weight.
Let the mixture ſtand upon warm ſand till the acid becomes ſweet, which is then to be poured off, and freſh acid added until it ceaſe to become ſweet, then evaporate all the liquor, freed from impurities, in a glaſs veſſel, to the conſiſtence of thin honey, and ſet it aſide in a cold place, that cryſtals may be formed, which are to be dried in the ſhade. The remaining liquor is again to be evaporated, that new cryſtals may be formed; and the evaporation is to be repeated until no more cryſtals concrete.

CERUSSA ACETATA. *Lond.*
Acetated Ceruſe.

Take of
Ceruſe, one pound;
Diſtilled vinegar, one gallon and a half.
Boil the ceruſe with the vinegar until the vinegar is ſaturated; then filter through paper, and, after proper evaporation, ſet it aſide to cryſtallize.

Dub.

Take of
Ceruſe, any quantity;
Diſtilled vinegar, ten times as much.
Digeſt in a glaſs veſſel, until the vinegar become ſweet. Having poured this off, add more vinegar, until it ceaſe to become ſweet. Filter the liquor, and evaporate it ſlowly, ſo that it may form cryſtals, which are to be dried in the ſhade.

THE acetate of lead is ſeldom prepared by the apothecary, as he can procure it at an infinitely cheaper rate from thoſe who manufacture it in large quantities. The preparation of it, as directed by the colleges, is a caſe of ſimple ſolution. The proceſs frequently fails, from the oxide of lead employed being adulter-

ated with carbonate of lime, or ſome other earthy ſubſtance. The acetic acid employed, ſhould be as ſtrong as can be procured; for with a weak acid the product of pure ſalt is ſmall, and the quantity of mother-water is increaſed. The addition of a ſmall quantity of alcohol to the ſolution, after it has been duly evaporated, is ſaid to improve the beauty of the cryſtals. The mother-water, (which probably is eſſentially the ſame with Goulard's extract of lead), may alſo be made to furniſh pure cryſtals, by adding to it a freſh portion of acetic acid; for, without that precaution it furniſhes only a very heavy, yellow, pulverulent maſs, in which there ſeems to be an exceſs of oxide of lead, whereas the cryſtalliſed ſalt is in fact a ſuper-acetate of lead.

The manufacture of acetate of lead is conducted more economically when the oxide is diſſolved in the acid at the ſame time that it is prepared, which is done by alternately expoſing plates of lead to the vapour of acetic acid, and immerſing the plates, thus covered with oxide, into the acid itſelf.

Acetate of lead has a ſweet ſtyptic taſte. It has a white colour, and cryſtallizes in flat parallelopipeds, terminated by a wedge, or more commonly in ſhining needles. It is ſoluble in water and in alcohol; effloreſces ſlightly in the air, and is decompoſed by heat and light. It reddens vegetable blues, and is decompoſed by the alkalies, and moſt of the earths and acids.

Medical uſe.—The internal uſe of acetate of lead, notwithſtanding the encomiums ſome have been raſh enough to beſtow upon it, is entirely to be rejected. It forms, however, a very valuable external application in ſuperficial and phlegmonic inflammations, bruiſes, and diſeaſes of the ſkin. It is always applied in ſolution, either ſimply, as to the eyes, or by means of cloths ſoaked in it, or mixed with bread-crumb. A drachm, with five ounces of any diſtilled water, forms a ſtrong ſolution, and with ten ounces of water, a weak ſolution. If common water be uſed, the addition of about a drachm of acetous acid will be neceſſary to keep the lead in ſolution.

Off. prep.—Acid. acetoſ. forte. *Ed.* Solutio acet. zinci. *Ed.* Ungt. acet. zinci. *Ed. Lond. Dub.*

AQUA LITHARGYRI ACETATI. *Lond.* LIQUOR LITH. ACET.; olim EXTRACTUM SATURNI. *Dub.*

Water of Acetated Litharge; formerly *Extract of Lead.*

Take of

Litharge, two pounds and four ounces;

Diſtilled vinegar, one gallon.

Mix and boil to ſix pints, conſtantly ſtirring, then ſet it aſide. After the feces have ſubſided, ſtrain.

Off. prep.—Ceratum lith. acet. *Lond. Dub.*

LIQUOR LITHARGYRI ACETATI COMPOSITUS. *Dub.* AQUA LITH. ACET. COMPOSITA. *Lond.*
Compound Liquor of Acetated Litharge.

Take of
Liquor of acetated litharge, a drachm ;
Diftilled water, fourteen ounces, (one pint, *Lond.*) ;
Weaker fpirit of wine, a drachm.
Mix the fpirit and liquor of acetated litharge, then add the diftilled water.

UNTIL the ingenious experiments of Dr. Bostock, it was believed that thefe preparations did not differ from folutions of the fame ftrength of acetate of lead, and that they were lefs proper, as their ftrength was apt to vary. He has, however, fhewn that thefe conclufions were hafty and inaccurate. By his analyfis, it appears that the conftituents in the faturated folution of the acetate of lead and of the water of acetated litharge are refpectively,

	Former.	Latter.
Oxide of lead,	16.8	23.1
Acetic acid,	7.5	5.
Water,	75.7	71.9
	100.	100.

From this analyfis, and the circumftance that the latter does not redden vegetable blues, while the former does, the former, the prefent acetite of lead of the Edinburgh college, fhould be named the fuper-acetate of lead, and the latter the water of acetate of lead. The vitrified oxide of lead made ufe of in this inftance is lefs eafily foluble, on account of its great force of aggregation, than the white oxide; but, on the other hand, it is lefs liable to be adulterated. This preparation is a much more delicate teft than the folution of the preceding acetate; but this tendency to decompofition renders the addition of the diluted alcohol neceffary, to prevent it, although it alfo renders it flightly ftimulant.

CHAP. XI.

T I N.

STANNI PULVIS. *Lond.*
Powder of Tin.

Take of
Tin, four ounces.
Melt it, and take off the fcoriæ, then pour it into a clean iron

vessel. Reduce it to powder, either by agitation or trituration, and pass the fine part of the powder through a hair sive.

Dub.

Take of
Tin, any quantity.
Having melted it over the fire, agitate it while it is cooling with an iron spatula, until it be reduced to powder, which is to be passed when cold through a sieve.

The college of Edinburgh do not give this preparation, inserting *Limatura et Pulvis Stanni* in their list of the materia medica.

Medical use.—It is often employed as a remedy against worms, particularly the flat kinds, which too often elude the force of other medicines. The general dose is from a scruple to a drachm; some confine it to a few grains; but Dr. Alston assures us, in the Edinburgh Essays, that its success chiefly depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartic is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them are removed almost immediately upon taking the first dose of the tin. This practice is sometimes successful in the expulsion of tæniæ, but by no means so frequently as Dr. Alston's observations would lead us to hope.

Blaine's powder, which certainly succeeds sometimes in curing the distemper in dogs, seems to be a sulphuretted oxide of tin.

CHAP. XII.

ZINC.

OXIDUM ZINCI. *Edin.*
Oxide of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a

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small piece of zinc, about the weight of a drachm. The zinc soon inflames, and is at the same time converted into white flakes, which are to be from time to time removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxide of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxide of zinc is to be prepared in the same way as the carbonate of lime.

ZINCUM CALCINATUM. *Lond.*
Calcined Zinc.

Take of
Zinc, broken into pieces, eight ounces.
Throw the zinc at several times into an ignited, large, deep, and inclined crucible, placing over it another crucible, in such a manner that the air may have free access to the burning zinc. Take out the calx as soon as it appears, and pass its white and lighter part through a sieve.

CALX ZINCI; olim FLORES ZINCI. *Dub.*
Calx of Zinc; formerly Flowers of Zinc.

Take of
Zinc, broken into pieces, any quantity.
Throw it, at different times, into a sufficiently deep crucible, heated red-hot, and placed with its mouth inclined towards the mouth of the furnace. After each time any zinc is thrown in, cover the crucible with another inverted over it, but so that the air may have access to the zinc. Preserve the white and very light calx for use.

THIS is an instance of simple oxidizement. At a red heat, zinc attracts the oxygen of the atmosphere so strongly, that it is quickly covered with a crust of white oxide, which prevents the air from acting on the metal below; and therefore we are desired to operate only on small pieces at a time, and to place the crucible so that we may easily take out the oxide formed, and introduce fresh pieces of zinc. As soon as the crust of oxide is broken or removed the zinc inflames, and burns with a brilliant white or greenish, blue flame, being at the same time converted into very light white flocculi. To save these as much as possible, we are directed to use a very deep and large crucible, and to cover it with an inverted crucible. But as we must not cover it so as to prevent the access of the air, it is doubtful whether the latter precaution be of much service. The greater part of the zinc is, however,

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oxidized in the crucible, without being previoufly converted into vapour; and as this portion of the oxide is always mixed with particles of zinc, it is neceffary to feparate them by trituration and elutriation.

The oxide thus obtained is of a pure white colour, without fmell or tafte, infufible and fixed in the fire, infoluble in water or alcohol, and entirely foluble in acids. The prefence of lead in it is detected by fulphuric acid, which forms in that cafe an infoluble fulphate of lead. The white oxide of zinc contains 82.15 zinc, and 17.85 oxygen.

Medical ufe.—White oxide of zinc is applied externally as a detergent and exficcant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But befides being applied externally, it has alfo of late been ufed internally. In dofes from one to feven or eight grains, it has been much celebrated in the cure of epilepfy and feveral fpafmodic affections: and there are fufficient teftimonies of their good effects, where tonic remedies in thofe affections are proper.

Off. prep.—Ungt. oxidi zinci, *Ed.*

CARBONAS ZINCI IMPURUS PRÆPARATUS; olim LAPIS CALAMINARIS PRÆPARATUS. *Edin.*

Prepared Impure Carbonate of Zinc, formerly *Prepared Calamine.*

The impure carbonate of zinc, after being roafted by thofe who make brafs, is prepared in the fame way as carbonate of lime.

LAPIS CALAMINARIS PRÆPARATUS. *Dub.*

Prepared Calamine.

Reduce calcined calamine to powder, and feparate the impalpable parts in the fame manner that is directed in the preparation of crabs claws.

Lond.

See the preparation of fubftances infoluble in water.

As this oxide of zinc is intended for external application, and often to parts very eafily irritated, too much pains cannot be beftowed in reducing it to a fine powder.

OXIDUM ZINCI IMPURUM PRÆPARATUM; olim TUTIA PRÆPARATA. *Edin.*

Prepared Impure Oxide of Zinc, formerly *Prepared Tutty.*

It is prepared as carbonate of lime.

TUTIA PRÆPARATA. *Lond.*
Prepared Tutty.

See the preparation of ſubſtances inſoluble in water.

THIS oxide is alſo prepared for external uſe only.

SULPHAS ZINCI. *Ed.*
Sulphate of Zinc.

Take of
 Zinc, cut into ſmall pieces, three ounces;
 Sulphuric acid, five ounces.
 Water, twenty ounces.

Mix them, and when the effervescence is finiſhed, digeſt the mixture for a little on hot ſand; then ſtrain the decanted liquor through paper, and after proper evaporation ſet it apart, that it may cryſtallize.

ZINCUM VITRIOLATUM. *Lond. Dub.*
Vitriolated Zinc.

Take of
 White vitriol, one pound;
 Vitriolic acid, one drachm;
 Boiling diſtilled water, three pints.

Mix and filter through paper. After proper evaporation, ſet it aſide in a cold place to cryſtallize.

THE ſulphate of zinc of commerce is never pure, but always contains iron, copper, and a little lead. From the mode of its preparation, there is alſo a deficiency of acid and water of cryſtallization. The means directed for purifying it by the London and Dublin colleges will ſupply theſe, but do not ſeparate the foreign metals, except perhaps the lead. If, therefore, a pure ſulphate of zinc be wanted, we may, according to the directions of the Edinburgh college, diſſolve pure zinc in pure ſulphuric acid; but we believe this proceſs is very rarely practiſed, eſpecially as the common ſulphate of zinc may be ſufficiently purifyed by expoſing it in ſolution to the air, by which means red oxide of iron is precipitated, and by digeſting it upon pure zinc, which precipitates the other metals.

Sulphate of zinc cryſtallizes in tetrahedral priſms terminated by pyramids. It has a metallic ſtyptic taſte; effloreſces ſlowly when expoſed to the air. It is ſoluble in 2.5 parts of water at 60°, and in much leſs boiling water. It is not ſoluble in alcohol. It is decompoſed by the alkalies and earths, hydroguretted ſulphurets, and ſulphuretted hydrogurets. It conſiſts of 20 oxide of zinc, 40 acid, and 40 water of cryſtallization.

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Medical use.—Sulphate of zinc, in doses from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time perfectly safe. It is therefore given, when immediate vomiting is required, as in cases where poison has been swallowed. By employing it internally, in smaller doses, it acts as a tonic; and some think it in every case preferable to the oxide of zinc.

Externally, it is used as a styptic application to stop hæmorrhagies; diminish increased discharges, as gonorrhœa; and to cure external inflammations arising from debility and relaxation of the blood-vessels, as in some cases of ophthalmia.

Off. prep.—Solutio sulphat. zinci, *Ed.* Aqua zinci vitriol cum camph. *Lond.* Aqua alum. comp. *Lond.* Solutio acet. zinci, *Ed.*

SOLUTIO SULPHATIS ZINCI. *Ed.*

Solution of Sulphate of Zinc.

Take of
 Sulphate of zinc, sixteen grains;
 Water, eight ounces;
 Diluted sulphuric acid, sixteen drops.
Dissolve the sulphate of zinc in the water; then, having added the acid, filter through paper.

The acid is here added to dissolve the excess of oxide of zinc, which the common sulphate often contains. This solution is of a strength proper for injecting into the urethra in gonorrhœa, or applying to the eyes in chronic ophthalmia.

AQUA ZINCI VITRIOLATI CUM CAMPHORA. *Lond.*

Water of Vitriolated Zinc with Camphor.

Take of
 Vitriolated zinc, half an ounce;
 Camphorated spirit, half an ounce, by measure;
 Boiling water, two pints.
Mix and filter through paper.

It is used externally as a lotion for some ulcers, particularly those in which it is necessary to restrain a great discharge. It is also not unfrequently employed as a collyrium in some cases of ophthalmia, where a large discharge of watery fluid takes place from the eyes with but little inflammation; but when it is to be applied to this tender organ, it ought first, at least, to be diluted by the addition of more water.

AQUA ALUMINIS COMPOSITA. *Lond.*
Compound Alum Water.

Take of
  Alum,
  Vitriolated zinc, of each half an ounce;
  Boiling diſtilled water, two pints.
Pour the water on the ſalts in a glaſs veſſel, and ſtrain.

THIS water was long known in our ſhops, under the title of *Aqua aluminoſa Bateana.*

It is uſed for cleanſing and healing ulcers and wounds; and for removing cutaneous eruptions, the part being bathed with it hot three or four times a-day. It is ſometimes likewiſe employed as a collyrium; and as an injection in gonorrhœa and fluor albus, when not accompanied with virulence.

SOLUTIO ACETITIS ZINCI. *Ed.*
Solution of Acetite of Zinc.

Take of
  Sulphate of zinc, one drachm;
  Diſtilled water, ten ounces.
Diſſolve.

Take of
  Acetite of lead, four ſcruples;
  Diſtilled water, ten ounces.
Diſſolve.
Mix the ſolutions; let them ſtand at reſt a little, and then filter the liquor.

THIS is a caſe of double elective attraction, the lead combining and forming an inſoluble compound with the ſulphuric acid, while the zinc unites with the acetic acid, and remains in ſolution.

The acetate of zinc may be obtained by evaporation in talcy cryſtals. It is ſoluble in water, and is decompoſed by heat. It is not poiſonous.

When cryſtallized acetate of lead and ſulphate of zinc are triturated together, the mixture preſently becomes moiſt, which is owing to the new compounds combining with leſs water of cryſtallization than the original ſalts, by which means a portion of the water is diſengaged in its fluid form.

Med. uſe.—The ſolution of acetate of zinc is with many practitioners deſervedly much eſteemed as an aſtringent collyrium, and injection.

CHAP. XIII.

ALCOHOL, ETHER, and ETHEREAL SPIRITS.

ALCOHOL. *Lond.*
Alcohol.

Take of
Rectified ſpirit of wine, one gallon;
Prepared kali, heated, one pound and a half;
Pure kali, one ounce.

Mix the vinous ſpirit with the pure kali, and afterwards add one pound of the hot prepared kali; ſhake them, and digeſt for twenty-four hours. Pour off the ſpirit, to which add the reſt of the prepared kali, and diſtil in a water bath. It is to be kept in a veſſel well ſtopped. The kali ſhould be heated to 300° Fahrenheit.

The ſpecific gravity of alcohol is to that of diſtilled water as 815 to 1000.

Dub.

Take of
Rectified ſpirit of wine, five pounds;
Pearl-aſhes, dried over the fire, and ſtill warm, one pound;
Cauſtic vegetable alkali, in powder, one ounce.

ix the ſpirit and the cauſtic alkali; add the pearl-aſhes, previouſly reduced to powder; and digeſt the mixture for three days, frequently agitating it, then pour off the ſpirit, and diſtil over three pounds with a moderate heat.

The ſpecific gravity of this ſpirit is to that of diſtilled water as 820 to 1000

The theory of theſe proceſſes has been already explained, and alſo the ſuperiority of muriate of lime over carbonate of potaſs for ſeparating the laſt portions of water from alcohol. The potaſs is uſed by the London and Dublin colleges in ſuch ſmall quantity that it can have little effect; when added in conſiderable quantity, it acts upon the alcohol itſelf, and decompoſes it, converting it into an ethereal liquor. The Edinburgh college

give no directions for the preparation of a perfectly pure alcohol, as it is never used in pharmacy; but it is perhaps to be regretted, that they have given the title of alcohol to a liquid which is not the alcohol of chemists.

ÆTHER SULPHURICUS. *Ed.*
Sulphuric Ether.

Take of
Sulphuric acid,
Alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort fit for sustaining a sudden heat, and add to it the acid in an uninterrupted stream. Mix them by degrees, shaking them moderately and frequently, and instantly distil from sand previously heated for the purpose, into a receiver kept cool with water or snow. The heat must also be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces are drawn off, when the retort is to be removed from the sand.

To the distilled liquor add two drachms of potass, and distil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off.

If sixteen ounces of alcohol be poured upon the acid remaining in the retort after the first distillation, and the distillation be repeated, more ether will be obtained; and this may be repeated several times.

ÆTHER VITRIOLICUS. *Lond.*
Vitriolic Ether.

Take of
The spirit of vitriolic ether, two pounds by weight;
Water of pure kali, one ounce by measure.

Shake them together, and distil, with a gentle heat, fourteen ounces by measure.

ÆTHER VITRIOLICUS. *Dub.*
Vitriolic Ether.

Take of
Vitriolic ethereal liquor, sixteen ounces;
Caustic vegetable alkali, in powder, two drachms.

Mix them, and distil with a gentle heat ten ounces from a very high retort into a cooled receiver.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Ed.*
Sulphuric Ether with Alcohol.

Take of
Sulphuric ether, one part;
Alcohol, two parts.
Mix them.

SPIRITUS ÆTHERIS VITRIOLICI. *Lond.*
Spirit of Vitriolic Ether.

Take of
Rectified ſpirit of wine,
Vitriolic acid, each one pound.
Pour the acid gradually upon the ſpirit, and mix them by ſhaking, then diſtil with a gentle heat, from a retort into a tubulated receiver, to which another recipient is fitted, the ſpirit of vitriolic ether, till ſulphureous vapours begin to riſe.
If another receiver be applied, and the diſtillation continued, a little oil of wine will be obtained, which is to be preſerved for uſe.

LIQUOR ÆTHEREUS VITRIOLICUS. *Dub.*
Vitriolic Ethereal Liquor.

Take of
Rectified ſpirit of wine,
Sulphuric acid, each thirty-two ounces.
Put the ſpirit into a glaſs retort, capable of ſupporting a ſudden heat, and pour upon it the acid in a continued ſtream. Mix them gradually, and having placed the retort in ſand previouſly heated, diſtil the liquor into a cool receiver, But the heat is to be ſo regulated, that the mixture may boil as ſoon as poſſible; and the retort is to be removed from the ſand when ſixteen ounces have come over.

OLEUM VINI. *Lond.*
Oil of Wine.

Take of
Alcohol,
Vitriolic acid, of each one pint.
Mix them by degrees, and diſtil; taking care that no black froth paſs into the receiver. Separate the oily part of the diſtilled liquor from the volatile vitriolic acid. To the oily part add as much water of pure kali as is ſufficient to correct the ſulphureous ſmell; then diſtil off the little ether with a gentle heat.

The oil of wine will remain in the retort, ſwimming on the watery liquor; from which it is to be ſeparated.

SPIRITUS ÆTHERIS VITRIOLICI COMPOSITUS. *Lond.*
Compound Spirit of Vitriolic Ether.

Take of
Spirit of vitriolic ether, two pounds;
Oil of wine, three drachms.
Mix them

LIQUOR ÆTHEREUS OLEOSUS; olim LIQUOR HOFFMANNI ANODYNUS. *Dub.*
Oily Ethereal Liquor, formerly *Anodyne Liquor of Hoffman.*

Take what remains in the retort after the diſtillation of the vitriolic ether.
Diſtil to one half with a moderate heat.

THE products ariſing from the decompoſition of alcohol by the action of the acids are extremely curious and intereſting. The theory of their formation was not underſtood until lately, when it was very ingeniouſly attempted by Fourcroy and Vauquelin, who endeavour to ſhew that the acid remains unchanged, and that the alcohol is converted into ether, water, and charcoal.

The moſt convenient way of mixing the ingredients is to put the alcohol into a tubulated retort, and, with a long tubed funnel reaching down to the bottom of the retort, to pour in the acid. By cautious agitation the two fluids unite, and heat is produced, which may be taken advantage of in the diſtillation, if we have a ſand bath previouſly heated to the ſame degree, to ſet the retort into immediately after the mixture is completed; nor is there any occaſion for a tubulated receiver, if we immerſe the ordinary receiver, which ought to be large, in water, or bury it in broken ice.

The diſtillation ſhould be performed with an equal and very gentle heat. The juncture of the retort and recipient is to be luted with a paſte made of linſeed meal, and further ſecured by a piece of wet bladder.

Immediately on mixing the acid with the alcohol, there is a conſiderable increaſe of temperature, and a ſlight diſengagement of alcohol, ſomewhat altered, and having an aromatic odour. On placing the retort in the ſand bath, a portion of pure alcohol firſt comes over; and when the mixture in the retort boils, the ether riſes, and is condenſed in thin, broad, ſtraight ſtreaks, having the appearance of oil. Until the liquor which paſſes over

into the receiver amounts to about half, or ſomewhat more than half, of the alcohol operated on, it conſiſts almoſt entirely of alcohol and ether, and there has been no production of any permanently elaſtic fluid: but now the product of ether ceaſes; the ſulphuric acid is decompoſed; and ſulphureous vapours begin to ariſe, which condenſe in irregular ſtreaks, or in drops: we muſt therefore either put a ſtop to the proceſs, or change the receiver. In the latter caſe, the products are ſulphureous acid, acetic acid, water, and oil of wine, as it was called, accompanied towards the end by a peculiar ſpecies of carburetted hydrogen gas, called by the Dutch chemiſts Olefiant gas; becauſe, when mixed with oxygenized muriatic acid, it forms oil. At laſt the matter in the retort, which has now become thick and black, ſwells up, and prevents us from carrying the proceſs further.

If we ſtop the proceſs before the ſulphureous vapours ariſe, the whole acid, diluted with a proportion of water, and mixed with charcoal, remains in the retort; but if we allow the proceſs to go on, there is a continual decompoſition of the acid, which is therefore diminiſhed in quantity. In either caſe, according to Prouſt, the ſulphuric acid may be obtained from the black reſiduum in the retort, by diluting it with twice its weight of water, filtering it through linen, and evaporating it till it acquire the ſpecific gravity 1.84, then adding about one five-hundredth part of nitrate of potaſs, and continuing the evaporation until the acid become perfectly colourleſs, and acquire the ſpecific gravity of 1.86. The reſiduum, however, may be more advantageouſly preſerved, as the Edinburgh college direct, for preparing more ether, by repeating the proceſs with freſh quantities of alcohol. Prouſt indeed denies that this reſiduum is capable of converting more alcohol into ether; but that excellent chemiſt has ſomehow fallen into error, for it is a fact, that was known in the time of that no leſs excellent chemiſt Dr. Lewis, and inſerted in his firſt edition of this Diſpenſatory, publiſhed in 1753, and not a recent diſcovery of Citizen Cadet, as Fourcroy would lead us to believe. If farther confirmation be wanted, we ſhall inſtance Göttling, who ſays, that from three or four pounds of this reſiduum, he has prepared 60 or 70 pounds of the ſpirit of vitriolic ether, and more than twelve pounds of vitriolic ether, without rectifying the reſiduum, or allowing the ſulphureous vapour to evaporate. The ether may be ſeparated from the alcohol and ſulphureous acid, with which it is always mixed, by re-diſtilling it with a very gentle heat, after mixing it with potaſs, or rather lime, which combine with the acid, or with black oxide of manganeſe, which converts the ſulphureous into ſulphuric acid, and thus deprives it of its volatility.

Med. uſe.—The chemical properties of ether have been already

noticed. As a medicine taken internally, it is an excellent antiſpaſmodic, cordial, and ſtimulant. In catarrhal and aſthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of ſugar on which ether has been dropt. It is given as a cordial in nauſea, and in febrile diſeaſes of the typhoid type; as an antiſpaſmodic, in hyſteria, and in other ſpaſmodic and painful diſeaſes; and as a ſtimulus in ſoporoſe and apoplectic affections. Regular practitioners ſeldom give ſo much as half an ounce, much more frequently only a few drops, for a doſe; but empirics have ſometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very oppoſite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied cloſely with the hand, it proves a powerful ſtimulent and rubefacient, and excites a ſenſation of burning heat. In this way it is frequently uſed for removing pains in the head or teeth. On the contrary, if it be dropt on any part of the body, expoſed freely to the contact of the air, its rapid evaporation produces an intenſe degree of cold; and as this is attended with a proportional diminution of bulk in the part to which it is applied, in this way it has frequently facilitated the reduction of ſtrangulated hernia.

The mixture of ether with alcohol, whether prepared directly by mixing them as the Edinburgh college direct, or in the impure ſtate in which it comes over in the firſt part of the proceſs for diſtilling ether, the ſpirit of vitriolic ether of the London, and the vitriolic ethereal liquor of the Dublin, colleges, poſſeſſes ſimilar virtues with ether, but in an inferior degree.

Off. Prep.—Tinct. aloes æther, *Ed.* Æth. ſulph. cum alc. aromaticus, *Ed.*

SPIRITUS ÆTHERIS NITROSI. *Ed.* LIQUOR ÆTHEREUS NITROSUS. *Dub.*

Spirit of Nitrous Ether. Nitrous Ethereal Liquor.

Take of

Alcohol, three pounds;

Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a veſſel full of cold water, and add the acid by degrees, conſtantly agitating them. Let the phial be ſlightly covered, and placed for ſeven days in a cool place; then diſtil the liquor with the heat of boiling water into a receiver kept cool with water or ſnow, till no more ſpirit comes over.

Spiritus Ætheris Nitrosi. *Lond.*
Spirit of Nitrous Ether.

Take of
Rectified ſpirit of wine, two pints;
Nitrous acid, half a pound.
Mix them, by pouring in the acid to the ſpirit, and diſtil with a gentle heat one pound ten ounces.

The action of alcohol and nitrous acid upon each other is much influenced by their proportions. If we uſe a ſmall proportion of alcohol, or pour alcohol into nitrous acid, there immediately takes place a great increaſe of temperature, and a violent effervefcence and diſengagement of red fumes. On the contrary, by placing the phials containing the alcohol and acid, in cold, or rather iced water, they may be mixed, without danger, in the proportions directed by the colleges, and if the acid be added in ſmall quantities at a time, and each portion thoroughly mixed with the alcohol by agitation, I find that no action takes place until heat be applied. It is therefore unneceſſary to keep the mixture for ſeven days; but we may immediately proceed to the diſtillation, which muſt be performed with a very ſlow and well regulated fire; for the vapour is very apt to expand with ſo much violence as to burſt the veſſels; and the heat muſt at no time exceed 212°, otherwiſe a portion of undecompoſed acid will paſs over and ſpoil the product. By performing this operation carefully in a Woulfe's apparatus, I got, in the receiver, from three ounces of alcohol, ſpecific gravity 0.841, and one ounce of nitrous acid, two ounces four drachms of ſpirit of nitrous ether, ſpecific gravity 0.887. Eight ounces of alcohol, contained in the firſt phial connected with the receiver, gained one drachm and a half, and acquired ſpecific gravity 0.873, and eight ounces of water in the ſecond, 18 grains: the reſiduum weighed ſeven drachms and a half. There was therefore a loſs of two drachms forty-two grains of permanently elaſtic fluids. The firſt portion of theſe that was examined ſeemed to be the air of the apparatus: in the next the candle burnt with an enlarged and brightened flame: Was it nitrous oxide? and all that paſſed afterwards was a mixture of carbonic acid and the etherized nitrous gas firſt deſcribed by the Dutch chemiſts. When recently prepared, this gas is inflammable, and does not form red fumes, on coming into contact with atmoſpheric air: but when attempted to be kept over water, the water becomes acidulous, the gas is diminiſhed in bulk about two thirds, loſes its inflammability, and is now converted into red vapour on the admiſſion of atmoſpheric air. It therefore appears to conſiſt of nitric oxide

gas, holding ether in chemical ſolution. I have formed a ſimilar gas, by admitting a few drops of ether to nitrous oxide gas over mercury. The Edinburgh and Dublin colleges direct the diſtillation to be continued till no more ſpirit comes over. But how is this to be aſcertained? After having drawn off about two thirds, according to the directions of the London college, I again applied heat to the retort, and examining the air, which began to come over into the pneumatic apparatus, by careleſsly approaching a lighted candle to the extremity of the tube, it kindled, and burſt the whole with a violent exploſion.

The ſpirit of nitrous ether thus obtained is a colourleſs fluid, of a fragrant odour, lighter than water, extremely volatile and inflammable, poſſeſſing properties in general analogous to the ſpirit of ſulphuric ether, but of conſiderably greater ſpecific gravity, ſtriking a deep olive, with a ſolution of green ſulphate of iron, and often, if not always, acid. By age and expoſure to the air, it is gradually decompoſed, and gives riſe to the re-production of more nitrous acid. When this change has taken place, it may be rectified by ſaturating the acid with lime-water, and rediſtilling the ethereal fluid. In all probability it is a mixture of nitrous ether and alcohol; for by diminiſhing the quantity of alcohol employed, we obtain a fluid having a ſimilar relation to the ſpirit of nitrous ether, that ſulphuric ether has to the ſpirit of ſulphuric ether; and by mixing nitrous ether with alcohol, we obtain a fluid exactly reſembling ſpirit of nitrous ether.

When alcohol and nitrous acid are mixed in the proportion neceſſary for the formation of nitrous ether, the utmoſt precautions muſt be taken to diminiſh their action on each other. Dr. Black contrived a very ingenious method of doing this, by rendering their mixture extremely ſlow. On two ounces of the ſtrong acid put into a phial, pour ſlowly and gradually about an equal quantity of water, which, by being made to trickle down the ſides of the phial, will float on the ſurface of the acid without mixing with it; then add, in the ſame cautious manner, three ounces of alcohol, which, in its turn, will float on the ſurface of the water. By this means the three fluids are kept ſeparate on account of their different ſpecific gravities, and a ſtratum of water is interpoſed between the acid and ſpirit. The phial containing the ſpirit muſt be ſtopped with a conical ſtopper, and this ſtopper confined to its place by a weak ſpring. The phial is now to be ſet in a cool place, and the acid will gradually aſcend, and the ſpirit deſcend, through the water, this laſt acting as a boundary to reſtrain their action on each other. When this commences, bubbles of gas riſe through the fluids, and the acid gets a blue colour, which it again loſes in the courſe of a few days, at which time a yellow nitrous ether begins to ſwim on

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the ſurface. As ſoon as the formation of air-bubbles ceaſes, it is time to remove the ether formed; for if allowed to remain, its quantity decreaſes. By this method a quantity of nitrous ether is formed, without the danger of producing elaſtic vapours or exploſion. The reſiduum of this proceſs is ſtill capable of forming a ſpirit of nitrous ether, with an additional quantity of alcohol.

By adding the acid to the alcohol in very ſmall quantities, and at conſiderable intervals, Mr. Dehne procured from two pounds of alcohol, and one pound ten ounces and three drachms of nitrous acid, one pound nine ounces and three drachms of ether: the reſiduum weighed one pound twelve ounces. There was therefore a loſs of five ounces. Mr. Dehne put the alcohol into a tubulated retort, to which a receiver was luted, and poured the acid through the tubulature, and the ether paſſed over into the receiver, without the application of any heat. The action of the acid on the alcohol did not begin until ſix ounces and a half were added, and was found to be exhauſted, when, on adding more acid, it fell to the bottom in the form of green drops. By uſing Mr. Dehne's precaution, of adding the acid gradually, I prepared nitrous ether in a Woulfe's apparatus, with perfect eaſe and ſafety, although Fourcroy repreſents it as a moſt dangerous operation. I introduced the acid gradually through a funnel luted into the tubulature of the retort. The tube of the funnel was very long, and its extremity was immerſed in the alcohol in the retort. This ſimple contrivance not only enabled me to add the acid as I pleaſed, but alſo acted as a tube of ſafety.

There is ſtill another method of forming nitrous ether, which is indeed ſaid to be preferable to thoſe mentioned. It was firſt practiſed by M. Voigt. Four pounds of dried nitrate of potaſs are to be introduced into a tubulated retort, connected with a Woulfe's apparatus; and a mixture of four pounds of ſulphuric acid, and three pounds four ounces of alcohol, is to be poured upon it. Without the application of any external heat, nitrous ether paſſes over into the receiver, and the reſiduum furniſhes, on more alcohol being added to it, ſpirit of nitrous ether.

When alcohol is converted into ether by the action of nitrous acid, the change produced on it is nearly the ſame with that produced by ſulphuric acid. In the latter caſe, it is effected by the affinities which form water, and charcoal is precipitated. In the former, it is effected by the affinities which form carbonic acid, and no water is formed.

Nitrous ether ſeems to differ from ſulphuric ether only in being combined with nitric oxide, at leaſt it is highly inflammable, pungent, volatile, and is not ſoluble in water, while it gives a

deep olive colour to green ſalts of iron, and has a conſiderable ſpecific gravity. When ſimply waſhed with water, I found it 0.912, when the acid which it evidently contained was removed by ſaturating it with potaſs it became 0.896, and when rectified, by re-diſtilling it, it became 0.866, but recovered decidedly acid properties, probably from the nitric oxide being acidified by the air of the apparatus.

Medical uſe.—Spirit of nitrous ether has been long deſervedly held in great eſteem. It quenches thirſt, promotes the natural ſecretions, expels flatulencies, and moderately ſtrengthens the ſtomach. It may be given in doſes of from twenty drops to a drachm, in any convenient vehicle. Mixed with a ſmall quantity of ſpiritus ammoniæ aromaticus, it proves a mild, yet efficacious, diaphoretic, and often remarkably diuretic; eſpecially in ſome febrile caſes, where ſuch a ſalutary evacuation is wanted. A ſmall proportion of this ſpirit added to malt ſpirits gives them a flavour approaching to that of French brandy.

CHAP. XIV.

HERBARUM et FLORUM EXSICCATIO.

Lond.

THE DRYING OF HERBS AND FLOWERS.

Let theſe, ſpread out lightly, be dried by a gentle heat.

Edin.

Herbs and flowers are to be dried by the gentle heat of a ſtove or common fire, in ſuch quantities at a time, that the proceſs may be finiſhed as quickly as poſſible; for by this means their powers are beſt preſerved; the teſt of which is the perfect preſervation of their natural colour.

The leaves of hemlock (*conium maculatum*), and of other plants containing a ſubtile volatile matter, muſt be immediately reduced to powder, after being dried, and afterwards kept in glaſs phials well corked.

FURTHER obſervations on the drying and preſervation of ſimple ſubſtances will be found in the Elements of Pharmacy.

SCILLÆ EXSICCATIO. *Lond.*
The Drying of Squill.

Cut the ſquill, after having removed its dry coats, tranſverſely into thin ſlices, and dry it by a gentle heat.

SCILLA MARITIMA EXSICCATA. *Ed.*
Dried Sea Squill.

Cut the root of the ſea-ſquill, after having removed its external coat, tranſverſely into thin ſlices, and dry it by a gentle heat. The ſign of its being properly dried is, that although rendered friable, it retains its bitterneſs and acrimony.

SCILLÆ PRÆPARATÆ. *Dub.*
Prepared Squills.

Cut the ſquills, after having removed their membranaceous integuments, as thin as poſſible, and ſuſpend the cut ſlices in the ſhade to dry. When dry, reduce them to powder, which is to be kept in a corked phial.

BY this method the ſquill dries much ſooner than when its ſeveral coats are only ſeparated; the internal part being here laid bare, while, in each of the entire coats, it is covered with a thin ſkin, which impedes the exhalation of the moiſture. The root loſes in this proceſs four fifths of its original weight; the parts which exhale with a moderate heat appear to be merely watery: hence ſix grains of the dry root are equivalent to half a drachm of it when freſh; a circumſtance to be particularly regarded in the exhibition of this medicine. But if too great heat has been employed to dry it, it becomes almoſt inert, and it alſo loſes its virtues by long keeping in the ſtate of powder.

Dried ſquills furniſh us with a medicine, ſometimes advantageouſly employed as an emetic, often as an expectorant, and ſtill more frequently as a powerful diuretic.

MILLIPEDÆ PRÆPARATIO. *Lond.* MILLIPEDÆ PRÆPARATÆ. *Dub.*
The Preparation of Millipeds. Prepared Millipeds.

The millipeds are to be incloſed in a thin canvaſs cloth, and ſuſpended over hot proof ſpirit in a cloſe veſſel, till they be killed by the ſteam, and rendered friable.

THIS is the laſt remains of a juſtly exploded practice, which aſcribed extraordinary virtues to whatever was barbarous and diſguſting.

SPONGIÆ USTIO. *Lond.* SPONGIA USTA. *Dub.*
The Burning of Sponge. Burnt Sponge.

Cut the ſponge in pieces, and bruiſe it, ſo as to free it from ſmall ſtones; burn it in a cloſe iron veſſel, until it becomes black and friable; afterwards reduce it to a very fine powder.

THIS medicine has been in uſe for a conſiderable time, and employed againſt ſcrofulous diſorders and cutaneous foulneſſes, in doſes of a ſcruple and upwards. Its virtues probably depend on the preſence of a little alkali. It alſo contains charcoal; and its uſe may be entirely ſuperſeded by theſe ſubſtances, which may be obtained in other manners, at a much cheaper rate.

CHAP. XV.

EXPRESSED JUICES.

THE juices of ſucculent plants are obtained by expreſſion. They are of a very compound nature, conſiſting of the ſap, the ſecreted fluids, and fecula, mixed together. When firſt procured, they are very high-coloured, turbid, and loaded with parenchymatous matter. They may be ſeparated by reſt, filtration, heat, and clarification. Reſt may be employed when the juice is very fluid, does not contain volatile matter, and is not ſuſceptible of alteration. It is, however, employed with advantage with ſub-acid juices, as that of lemons. By reſt they undergo a kind of ſlight fermentation, and all their mucilaginous, and other viſcid parts, ſeparate. Filtration is perhaps the moſt perfect means of defecation, but it is tedious, and applicable only to very fluid juices. In many inſtances it may be facilitated by the addition of water. The action of heat is more expeditious, and is employed for juices which are very alterable, or which contain volatile matters. It is performed by introducing the juice into a matraſs, and immerſing it in boiling water for ſome minutes. The feculæ are coagulated, and eaſily ſeparated by filtration. Clarification by white of egg can only be uſed for very viſcid mucilaginous juices, which contain nothing volatile. The white of two eggs may be allowed to each pint of juice. They are beat to a fine froth, the juice gradually mixed with them, and

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the whole brought to ebullition. The albumen coagulating envelopes all the parenchymatous and feculent matters, and the juice now paſſes the filter readily. By this proceſs juices are rendered ſufficiently fine; but the heat employed deepens their colour, and manifeſtly alters them, ſo that it is not merely a defecating, but a decompoſing, proceſs. When depurated, juices are yellow or red, but never green.

The fluids thus extracted from ſucculent fruits, whether acid or ſweet, from moſt of the acrid herbs, as ſcurvy-graſs and water-creſſes, from the acid herbs, as ſorrel and wood-ſorrel, from the aperient lacteſcent plants, as dandelion and hawkweed, and from various other vegetables, contain great part of the peculiar taſte and virtues of the reſpective ſubjects. The juices, on the other hand, extracted from moſt of the aromatic herbs, have ſcarcely any thing of the flavour of the plants, and ſeem to differ little from decoctions of them made in water boiled till the volatile odorous parts have been diſſipated. Many of the odoriferous flowers, as the lily, violet, hyacinth, not only impart nothing of their fragrance to their juice, but have it totally deſtroyed by the previous bruiſing. From want of ſufficient attention to theſe particulars, practitioners have been frequently deceived in the effects of preparations of this claſs: juice of mint has been often preſcribed as a ſtomachic, though it wants thoſe qualities by which mint itſelf and its other preparations operate.

There are equal differences in regard to their preſerving thoſe virtues, and this independently of the volatility of the active matter, or its diſpoſition to exhale. Even the volatile virtue of ſcurvy-graſs may, by the above method, be preſerved almoſt entire in its juice for a conſiderable time; while the active parts of the juice of the wild cucumber quickly ſeparate and ſettle to the bottom, leaving the fluid part inert. Juices of arum root, iris root, bryony root, and other vegetables, in like manner allow their medicinal parts to ſettle at the bottom.

If juices are intended to be kept for any length of time, about one-fortieth part of their weight of good ſpirit of wine may be added, and the whole ſuffered to ſtand as before; a freſh ſediment will now be depoſited, from which the liquor is to be poured off, ſtrained again, and put into ſmall bottles which have been waſhed with ſpirit and dried. A little oil is to be poured on the ſurface, ſo as very nearly to fill the bottles, and the mouths cloſed with leather, paper, or ſtopped with ſtraw, as the flaſks are in which Florence oil is brought to us: this ſerves to keep out duſt, and ſuffers the air to eſcape, which in proceſs of time ariſes from all vegetable liquors, and which would otherwiſe endanger the burſting of the glaſſes; or, being imbibed afreſh, render their contents vapid and foul. The bottles are to be kept on the bottom of a

good cellar or vault, placed up to the necks in ſand. By this method ſome juices may be preſerved for a year or two; and others for a much longer time, though, whatever care be taken, they are found to anſwer better when freſh; and from the difficulty of preſerving them, they have of late been very much laid aſide, eſpecially ſince we have been provided with more convenient and uſeful remedies. The following is the only compoſition of the kind retained in our pharmacopœias.

SUCCUS COCHLEARIÆ COMPOSITUS. *Lond.*
Compound Juice of Scurvy-Graſs.

Take of
Juice of Garden ſcurvy-graſs, two pints;
Brooklime,
Water-creſſes, of each one point;
Seville oranges, twenty ounces by meaſure.
Mix them, and, after the feces have ſubſided, pour off the liquor, or ſtrain it.

SUCCUS COCHLEARIÆ COMPOSITUS; vulgo, SUCCI AD SCORBUTICOS. *Edin.*
Compound Juice of Scurvy-Graſs.

Take of
Juice of Scurvy-graſs,
Water-creſſes, expreſſed from freſh gathered herbs,
Seville oranges, of each two pounds;
Spirit of nutmegs, half a pound.
Mix them, and let them ſtand till the feces have ſubſided, then pour off the clear liquor.

Both theſe compoſitions are of conſiderable uſe for the purpoſes expreſſed in the title: the orange juice is an excellent aſſiſtant to the ſcurvy-graſs, and other acrid antiſcorbutics; which, when thus mixed, have been found from experience to produce much better effects than when employed by themſelves. They may be taken in doſes from an ounce or two to a quarter of a pint, two or three times a-day; they generally increaſe the urinary ſecretion, and ſometimes induce a laxative habit.

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CHAP. XVI.

INSPISSATED JUICES.

THIS is a very convenient form for the exhibition of thoſe ſubſtances which are ſufficiently ſucculent to afford a juice by expreſſion, and whoſe virtues do not reſide in any very volatile matter. By inſpiſſation, the bulk of the requiſite doſe is very much diminiſhed; they are reduced to a form convenient for making up into pills; and they are much leſs apt to ſpoil than the ſimple expreſſed juices. The mode of their preparation is not yet, however, reduced to fixed principles. Some direct the juices to be inſpiſſated as ſoon as they are expreſſed; others allow them previouſly to undergo a ſlight degree of fermentation; ſome defecate them before they proceed to inſpiſſate them, and, laſtly, Baumé prepares his elaterium by inſpiſſating the defecated juice of the wild cucumber, while our colleges give the ſame name to the matter which ſubſides from it. The nature of the ſoil, of the ſeaſon, and many other circumſtances, muſt materially alter the quantity or nature of the product. In moiſt years Baumé got from thirty pounds of elder berries, four or five pounds of inſpiſſated juice, and in dry years only two, or two and a half. From hemlock he got in October 1769 $\frac{1}{12.5}$ of inſpiſſated juice, and in May of the ſame year only $\frac{1}{18.5}$; on the contrary, in Auguſt 1768 $\frac{1}{11.4}$, and in May 1770 $\frac{1}{15}$, but in general the product in the autumn months was greateſt. Hyociamus gave him about $\frac{1}{31.5}$, and belladonna $\frac{1}{14}$.

SUCCUS SPISSATUS ACONITI NAPELLI. *Ed.*
Inſpiſſated Juice of Wolfsbane.

Bruiſe the freſh leaves of wolfsbane, and including them in a hempen bag, compreſs them ſtrongly till they yield their juice, which is to be evaporated in flat veſſels heated with boiling water, ſaturated with muriate of ſoda, and immediately reduced to the conſiſtence of thick honey.

After the maſs has become cold, let it be put up in glazed earthen veſſels, and moiſtened with alcohol.

IN the ſame manner are prepared from their leaves,

SUCCI SPISSATI
ATROPÆ BELLADONNÆ, — *The Inſpiſſated Juices of Deadly Nightſhade.*

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SUCCI SPISSATI	*The Inspissated Juices of*
CONII MACULATI,	*Hemlock.*
HYOSCIAMI NIGRI,	*Henbane.*
LACTUCÆ VIROSÆ,	*Poisonous Lettuce.*

SUCCUS SPISSATUS CICUTÆ. *Dub.*
Inspissated Juice of Hemlock.

Express hemlock gathered when the flowers are just appearing, and allow the juice to stand six hours until the feces subside; then reduce the decanted juice to dryness in a water bath.

IN the same way is prepared from fresh gathered berries,

SUCCUS SPISSATUS SAMBUCI. *Dub.*
The Inspissated Juice of Elder-berries.

SUCCUS BACCÆ SAMBUCI SPISSATUS. *Lond.*
Inspissated Juice of the Elder-berry.

Take of
Expressed and depurated juice of elder-berries, two pints.
Inspissate in a water-bath saturated with sea-salt.

IN the same manner inspissate

SUCCUS	*The Juice of the*
RIBIS NIGRI,	*Black Currant.*
LIMONIS,	*Lemon.*
CICUTÆ, floribus primum apparentibus.	*Hemlock, when about to flower.*

SUCCUS SPISSATUS SAMBUCI NIGRI; vulgo ROB SAMBUCI. *Ed.*
Inspissated Juice of Elder-berries, commonly called *Elder Rob.*

Take of
Juice of ripe elder-berries, five pounds;
Double refined sugar, one pound.
Evaporate with a gentle heat to the consistence of pretty thick honey.

These inspissated juices contain the virtues of the respective vegetables in a very concentrated state. Those of the elder, black-currant, and lemon, are acidulous, cooling, and laxative, and may be used in considerable quantities, while those of the wolfsbane, hemlock, deadly nightshade, henbane, and poisonous lettuce, are

highly narcotic and deleterious, and muſt be given only in very ſmall doſes.

Fecula.

SUCCUS SPISSATUS MOMORDICÆ ELATERII; vulgo
ELATERIUM *Ed.* ELATERIUM *Lond.*
Inſpiſſated Juice of the Wild Cucumber. Elaterium.

Slice ripe wild cucumbers, expreſs the juice very gently, and ſtrain it through a very fine hair ſieve, (into a glaſs veſſel, *Lond.*) then boil it a little and ſet it by for ſome hours until the thicker part has ſubſided. The thinner ſupernatant fluid is to be poured off, and ſeparated by filtering; and the thicker part, which remains after filtration, covered with a linen cloth, and dried with a gentle heat.

THIS is not properly an inſpiſſated juice, but a depoſition from the expreſſed juice. Such depoſitions have long been called Fecula, and the denomination has been confirmed in modern times. Its application, however, appears to us to be too extended; for fecula is applied both to mild and nutritious ſubſtances, ſuch as ſtarch, and to draſtic ſubſtances, ſuch as that of which we are now treating. Beſides, if it poſſeſſed exactly the ſame chemical properties as ſtarch, it would be converted into a gelatinous maſs by the boiling directed by the Edinburgh college, and would not ſeparate; whereas, the boiling is intended to promote the ſeparation.

The filtration above directed, for draining off ſuch part of the watery fluid as cannot be ſeparated by decantation, is not the common filtration through paper, for this does not ſucceed here: the groſſer parts of the juice, falling to the bottom, form a viſcid cake upon the paper, which the liquid cannot paſs through. The ſeparation is to be attempted in another manner, by draining the fluid from the top. This is effected by placing one end of ſome moiſtened ſtrips of woollen cloth, ſkeins of cotton, or the like, in the juice, and laying the other end over the edge of the veſſel, ſo as to hang down lower than the ſurface of the liquor: by this management the ſeparation ſucceeds in perfection.

Med. uſe.—Elaterium is a very violent hydragogue cathartic. In general, previous to its operation, it excites conſiderable ſickneſs at ſtomach, and frequently produces ſevere vomiting. It is therefore ſeldom employed till other remedies have been tried in vain. But in ſome inſtances of aſcites it will produce a complete evacuation of water, where other cathartics have had no effect. Two or three grains are in general a ſufficient doſe, although perhaps the beſt mode of exhibiting it is by giving it only to the

extent of half a grain at a time, and repeating that dose every hour till it begins to operate.

Pulps.

PULPARUM EXTRACTIO. *Ed.* *Dub.*

The Extraction of Pulps.

Boil unripe pulpy fruits, and ripe ones if they be dry, in a small quantity of water until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey in an earthen vessel, over a gentle fire; taking care to keep stirring the matter continually, to keep it from burning.

(The pulp of cassia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be expressed through the sieve, without any previous boiling. *Ed.*)

PULPARUM PRÆPARATIO. *Lond.*

The Preparation of Pulps.

Set pulpy fruits, if they be unripe, or ripe and dry, in a moist place, that they may become soft, then press the pulps through a hair sieve; afterwards boil them first with a gentle heat, and stir them frequently, then evaporate the water in a water bath, saturated with sea salt, until the pulps acquire the proper consistency.

Pour boiling water on the bruised pods of the cassia fistularis, so as to wash out the pulp; then press the matter first through a coarse sieve, and afterwards through a hair sieve; lastly, evaporate the moisture in a water bath, saturated with sea salt, so as to reduce the pulp to a proper consistency.

Express the pulps of ripe recent fruits through a sieve, without boiling them.

When these fruits are not sufficiently juicy to afford a pulp by simple expression, the decoction ordered by the Edinburgh and Dublin colleges is much more certain, and in every respect preferable to exposing them to a moist air, which is not only often inefficacious, but is apt to render them spoilt and mouldy. On the other hand, the precaution used by the London college, of finishing the evaporation in a water bath, is highly proper, as otherwise they are extremely apt to become empyreumatic.

The pulps expressed from recent substances without coction, are

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lefs mucilaginous, are more apt to allow their fluid parts to feparate when left at reft, than when they have been previoufly boiled; and very fucculent vegetables, fuch as apples, pears, and Kly roots, may be roafted in hot afhes inftead of being boiled.

CHAP. XVII.

FIXED OILS.

THESE oils are commonly denominated Exprefsed oils, an appellation which is manifeftly improper, as in fome inftances they are obtained without expreffion, and in other inftances expreffion is employed to obtain volatile oils. The Edinburgh college have therefore diftinguifhed thefe different claffes of oils by the terms Fixed and Volatile, which accurately characterize them.

Fixed oil is formed in no other part of vegetables than in their feeds. Sometimes, although very rarely, it is contained in the parenchyma of the fruit. Of this the beft known example is the olive. But it is moft commonly found in the feeds of dicotyledonous vegetables, fometimes alfo in the fruit of monocotyledonous plants, as the cocos butyracea. It has various degrees of confiftency, from the tallow of the croton febiferum of China, and the butter of the butter-tree of Africa, to the fluidity of olive oil.

Fixed oils are either

1. Fat, eafily congealed, and not inflammable by nitric acid, oil of olives, almonds, rapefeed, and ben.
2. Drying, not congealable, inflammable by nitric acid, oil of linfeed, nut, and poppy.
3. Concrete oils, palm oil, &c.

Fixed oil is feparated from fruits and feeds which contain it, either by expreffion or decoction. Heat, by rendering the oil more limpid, increafes very much the quantity obtained by expreffion; but as it renders it lefs bland, and more apt to become rancid, heat is not ufed in the prepararation of oils which are to be employed in medicine. When obtained by expreffion,

oils often contain a mixture of mucilage, ſtarch, and colouring matter; but part of theſe ſeparate in courſe of time, and fall to the bottom. When oils become rancid, they are no longer fit for internal uſe, but are then ſaid to effect the killing of quickſilver, as it is called, more quickly. Decoction is principally uſed for the extraction of the viſcid and conſiſtent oils, which are melted out by the heat of the boiling water, and riſe to its ſurface.

Thoſe who prepare large quantities of the oil of almonds, blanch them, by ſteeping them in very hot water, which cauſes their epidermis to ſwell and ſeparate eaſily. After they peel them, they dry them in a ſtove, then grind them in a mill like a coffee mill, and laſtly, expreſs the oil from the paſte incloſed in a hempen bag. By blanching the almonds, the paſte which remains within the bag is ſold with greater advantage to the perfumers, and the oil obtained is perfectly colourleſs. But the heat employed diſpoſes the oil to become rancid, and the colour the oil acquires from the epidermis does not injure its qualities. For pharmaceutical uſe, therefore, the almonds ſhould not be blanched, but merely rubbed in a piece of coarſe linen, to ſeparate as much as poſſible, the brown powder adhering to the epidermis. Sixteen ounces of ſweet almonds commonly give five ounces and a half of oil. Bitter almonds afford the ſame proportion, but the oil has a pleaſant bitter taſte.

OLEUM AMYGDALÆ COMMUNIS. *Edin.*
Almond Oil.

Take of
Freſh almonds, any quantity.
After having bruiſed them in a ſtone mortar, put them into a hempen bag, and expreſs the oil without heat.

In the ſame manner is to be expreſſed from its ſeeds,

Oleum Lini Usitatissimi. *Oil of Linſeed.*

Oleum Amygdalæ. *Lond.*
Almond Oil.

Pound freſh almonds, either ſweet or bitter, in a mortar, then preſs out the oil in a cold preſs.

In the ſame manner are to be expreſſed,

Oleum Lini, *Linſeed Oil,* from the bruiſed ſeeds.

Oleum Ricini, *Castor Oil*, from the seeds previously decorticated.
Oleum Sinapeos, *Oil of Mustard*, from the bruised seeds.

Oleum Amygdalarum. *Dub.*
Oil of Almonds.

Bruise fresh almonds in a mortar, and express the oil in a press without heat.

In the same way are to be expressed from the seeds,

Oleum Lini, *Linseed Oil.*
Oleum Sinapis, *Oil of Mustard.*

The chemical properties of these oils have been already mentioned, and an account of the medical virtues of each will be found in their respective places in the Materia medica.

CHAP. XVIII.

OILY PREPARATIONS.

OLEUM AMMONIATUM, vulgo Linimentum Volatile. Ed.
Ammoniated Oil, commonly called *Volatile Liniment.*

Take of
Olive oil, two ounces;
Water of ammonia, two drachms.
Mix them together.

Linimentum Ammoniæ Fortius. *Lond.*
Stronger Liniment of Ammonia.

Take of
Water of pure ammonia, one ounce;
Olive oil, two ounces.
Shake them together in a phial.

LINIMENTUM AMMONIÆ. *Lond.*
Liniment of Ammonia.

Take of
Water of ammonia, half an ounce;
Olive oil, one ounce and a half.
Shake them together in a phial till they are mixed.

THE moſt commonly adopted generic name for the combination of oil with alkalies is Soap, and the ſpecies are diſtinguiſhed by the addition of that of the alkali they contain. On theſe principles, volatile liniment ſhould be called Soap of Ammonia, as hard ſoap is ſoap of ſoda, and ſoft ſoap, ſoap of potaſs.

The ammonia uſed in the two firſt of theſe preparations combines much more eaſily and intimately with the oil than the carbonate of ammonia uſed in the laſt. If the carbonate be employed with the view of rendering the preparation leſs ſtimulating, the ſame end will be more ſcientifically obtained, by increaſing the proportion of oil mixed with pure ammonia. The two firſt of theſe liniments differ greatly in point of ſtrength, the proportion of water of ammonia in the firſt, being as 1 to 8, and in the ſecond as 1 to 2.

Med. uſe.—They are frequently uſed externally as ſtimulants and rubefacients. In inflammatory ſore throats, a piece of flannel moiſtened with theſe ſoaps, applied to the throat, and renewed every four or five hours, is one of the moſt efficacious remedies. By means of this warm ſtimulating application, the neck, and ſometimes the whole body, is put into a ſweat, which, after bleeding, either carries off, or leſſens the inflammation. When too ſtrong, or too liberally applied, they ſometimes occaſion inflammations, and even bliſters. Where the ſkin cannot bear their acrimony, a larger proportion of oil may be uſed.

But the firſt of theſe preparations is even ſometimes uſed internally, made into a mixture with ſyrup and ſome aromatic water. A drachm or two taken in this manner, three or four times a-day, is a powerful remedy in ſome kinds of catarrh and ſore throat.

LINIMENTUM AQUÆ CALCIS, SIVE OLEUM LINI CUM CALCE. *Ed.*
Liniment of Lime Water, or Linſeed Oil with Lime.

Take of
Linſeed oil,
Lime water, of each equal parts.
Mix them.

THIS liniment is extremely uſeful in caſes of ſcalds or burns,

being ſingularly efficacious in preventing, if applied in time, the inflammation ſubſequent to theſe; or even in removing it, after it has come on.

It is alſo a ſpecies of ſoap, and might be called Soap of Lime, although it probably contains a great exceſs of oil.

OLEUM CAMPHORATUM. *Ed.*

Camphorated Oil.

Take of
Olive oil, two ounces;
Camphor, half an ounce.
Mix them ſo that the camphor may be diſſolved.

This is a ſimple ſolution of camphor in fixed oil, and is an excellent application to local pains from whatever cauſe, and to glandular ſwellings.

OLEUM SULPHURATUM. *Ed.*

Sulphuretted Oil.

Take of
Olive oil, eight ounces;
Sublimed Sulphur, one ounce.
Boil them together in a large iron pot, ſtirring them continually, till they unite.

Lond.

Take of
Flowers of ſulphur, four ounces.
Olive oil ſixteen ounces, by weight.
Boil the flowers of ſulphur, with the oil, in a pot ſlightly covered, until they be united.

Göttling directs the oil to be heated in an iron pot, and the ſulphur to be gradually added, while the ſolution is promoted by conſtant ſtirring with an iron ſpatula. The pot muſt be ſufficiently large, as the mixture ſwells and boils up very much; and as it is apt to catch fire, a lid ſhould be at hand to extinguiſh it by covering up the pot.

Medical uſe.—Sulphuretted oil was formerly ſtrongly recommended in coughs, conſumptions, and other diſorders of the breaſt and lungs: but the reputation which it had in theſe caſes, does not appear to have been derived from any fair trial or experience. It is manifeſtly hot, acrimonious, and irritating; and ſhould therefore be uſed with the utmoſt caution. It has frequently been found to injure the appetite, offend the ſtomach and viſcera, parch the body, and occaſion thirſt and febrile heats. The doſe

of it is from ten to forty drops. It is employed externally for cleanſing and healing foul running ulcers; and Boerhaave conjectures, that its uſe in theſe caſes gave occaſion to the virtues aſcribed to it when taken internally.

Off. prep.—Emplaſt. ammon. cum hydrarg. *Lond.* Emp. lith. cum hyd. *Lond.*

PETROLEUM SULPHURATUM. *Lond.*
Sulphuretted Petroleum,

Is prepared in the ſame way as ſulphuretted oil.

CHAP. XIX.

DISTILLED WATERS.

SUBSTANCES which differ in volatility, may be ſeparated from each other by applying a degree of heat capable of converting the moſt volatile into vapour, and by again condenſing this vapour in a proper apparatus. Water is converted into vapour at 212°, and may be ſeparated by diſtillation from the earthy and ſaline matters which it always contains in a natural ſtate. But, it is evident, that if any ſubſtances which are as volatile as water, be expoſed to the ſame degree of heat, either by immerſing them in boiling water, or expoſing them to the action of its ſteam, they will riſe with it in diſtillation. In this way the camphor and volatile oils of vegetable ſubſtances are ſeparated from the more fixed principles; and as water is capable of diſſolving a certain quantity of theſe volatile ſubſtances, it may be impregnated with a great variety of flavours by diſtilling it from different aromatic ſubſtances. If the ſubject of our diſtillation contain more volatile oil than the water employed is capable of diſſolving, it will render the water milky, and afterwards ſeparate from it. It is in this way that volatile oils are obtained.

Volatile oils are obtained only from odoriferous ſubſtances; but not equally from all of this claſs, nor in quantity proportional to their degree of odour. Some, which, if we were to reaſon from analogy, ſhould ſeem very well fitted for this proceſs, yield extremely little oil, and others none at all. Roſes and chamo-

mile flowers, whofe ftrong and lafting fmell promifes abundance, are found to contain but a fmall quantity of oil: the violet and jaffamine flower, which perfume the air with their odour, lofe their fmell upon the gentleft coction, and do not afford any oil on being diftilled, unlefs immenfe quantities are fubmitted to the operation at once; while favin, whofe difagreeable fcent extends to no great diftance, gives out the largeft proportion of volatile oil of almoft any vegetable known.

Nor are the fame plants equally fit for this operation, when produced in different foils or feafons, or at different times of their growth. Some yield more oil if gathered when the flowers begin to fall off than at any other time. Of this we have examples in lavendar and rue; others, as fage, afford the largeft quantity when young, before they have fent forth any flowers; and others, as thyme, when the flowers have juft appeared. All fragrant herbs yield a larger proportion of oil, when produced in dry foils and in warm fummers, than in oppofite circumftances. On the other hand, fome of the difagreeable ftrong-fcented ones, as wormwood, are faid to contain moft oil in rainy feafons, and when growing in moift rich grounds.

Several chemifts have been of opinion, that herbs and flowers, moderately dried, yield a greater quantity of volatile oil, than if they were diftilled when frefh. It is, however, highly improbable, that the quantity of volatile oil will be increafed by drying; on the contrary, part of it muft be diffipated and loft. But drying may fometimes be ufeful in other ways; either by diminifhing the bulk of the fubject to be diftilled, or by caufing it to part with its oil more eafily.

The choice of proper inftruments is of great confequence for the performance of this procefs to advantage. There are fome oils which pafs freely over the fwan-neck of the head of the common ftill: others, lefs volatile, cannot eafily be made to rife fo high. For obtaining thefe laft, we would recommend a large low head, having a rim or hollow canal round it: in this canal, the oil is detained in its firft afcent, and thence conveyed at once into the receiver, the advantages of which are fufficiently obvious.

With regard to the proportion of water to be employed; if whole plants, moderately dried, are ufed, or the fhavings of woods, as much of either may be put into the veffel as, lightly preffed, will occupy half its cavity; and as much water may be added as will fill two thirds of it. When frefh and juicy herbs are to be diftilled, thrice their weight of water will be fully fufficient; but dry ones require a much larger quantity. In general, there fhould be fo much water, that after all intended to be diftilled has come over, there may be liquor enough left to prevent the matter from burning to the ftill. The water and ingredients, alto-

gether, ſhould never take up more than three fourths of the ſtill; there ſhould be liquor enough to prevent any danger of any empyreuma, but not ſo much as to be apt to boil over into the receiver.

The ſubject of diſtillation ſhould be macerated in the water until it be perfectly penetrated by it. To promote this effect, woods ſhould be thinly ſhaved acroſs the grain, or ſawn, roots cut tranſverſely into thin ſlices, barks reduced into coarſe powder, and ſeeds ſlightly bruiſed. Very compact and tenacious ſubſtances require the maceration to be continued a week or two, or longer; for thoſe of a ſofter and looſer texture, two or three days are ſufficient; while ſome tender herbs and flowers not only ſtand in no need of maceration, but are even injured by it. The fermentation which was formerly preſcribed in ſome inſtances, is always hurtful.

With regard to the fire, the operator ought to be expeditious in raiſing it at firſt, and to keep it up during the whole proceſs, to ſuch a degree only, that the oil may freely diſtil; otherwiſe the oil will be expoſed to an unneceſſary heat; a circumſtance which ought as much as poſſible to be avoided. Fire communicates to all theſe oils a diſagreeable impregnation, as is evident from their being much leſs grateful when newly diſtilled, than after they have ſtood for ſome time in a cool place: and the longer the heat is continued, the greater alteration it produces in them.

The greater number of oils require for their diſtillation the heat of water ſtrongly boiling: but there are many alſo which riſe with a heat conſiderably leſs; ſuch as thoſe of lemon and citron peel; of the flowers of lavender and roſemary, and of almoſt all the more odoriferous kinds of flowers. We have already obſerved, that theſe flowers have their fragrance much injured, or even deſtroyed, by beating or bruiſing them; it is impaired alſo by the immerſion in water in the preſent proceſs, and the more ſo in proportion to the continuance of the immerſion and the heat; hence oils, diſtilled in the common manner, prove much leſs agreeable in ſmell than the ſubjects themſelves. For the diſtillation of ſubſtances of this claſs, another method has been contrived; inſtead of being immerſed in water, they are expoſed only to its vapour. A proper quantity of water being put into the bottom of the ſtill, the odoriferous herbs or flowers are laid lightly in a baſket, of ſuch a ſize that it may enter into the ſtill, and reſt againſt its ſides, juſt above the water. The head being then fitted on, and the water made to boil, the ſteam, percolating through the ſubject, imbibes the oil, without impairing its fragrance, and carries it over into the receiver. Oils thus obtained, poſſeſs the odour of the ſubject in an exquiſite degree, and

have nothing of the difagreeable fcent perceivable in thofe diftilled by boiling them in water in the common manner.

Plants differ fo much, according to the foil and feafon of which they are the produce, and likewife according to their own ages, that it is impoffible to fix the quantity of water to be drawn from a certain weight of them to any invariable ftandard. The diftillation may always be continued as long as the liquor runs well flavoured off the fubject, but no longer.

In the diftillation of volatile oils, the water, as was obferved in a foregoing fection, imbibes always a part of the oil. The diftilled liquors here treated of, are no other than water thus impregnated with the effential oil of the fubject; whatever fmell, tafte, or virtue, is communicated to the water, or obtained in the form of watery liquor, being found in a concentrated ftate in the oil.

All thofe vegetables, therefore, which contain an effential oil, will give over fome virtue to water by diftillation: but the degree of the impregnation of the water, or the quantity of water which a plant is capable of faturating with its virtue, are by no means in proportion to the quantity of its oil. The oil faturates only the water that comes over at the fame time with it: if there be more oil than is fufficient for this faturation, the furplus feparates, and concretes in its proper form, not mifcible with the water that arifes afterwards. Some odoriferous flowers, whofe oil is in fo fmall quantity, that fcarcely any vifible mark of it appears, unlefs fifty or an hundred pounds or more are diftilled at once, give neverthelefs as ftrong an impregnation to water as thofe plants which abound moft with oil.

Many have been of opinion, that diftilled waters may be more and more impregnated with the virtues of the fubject, and their ftrength increafed to any affigned degree, by *cohobation*, that is, by re-diftilling them repeatedly from frefh parcels of the plant. Experience, however, fhews the contrary. A water fkilfully drawn in the firft diftillation, proves on every repeated one not ftronger but more difagreeable. Aqueous liquors are not capable of imbibing above a certain quantity of the volatile oil of vegetables; and this they may be made to take up by one, as well as by any number of diftillations: the oftener the procefs is repeated, the ungrateful impreffion which they generally receive from the fire, even at the firft time, becomes greater and greater.

Thofe plants, which do not yield at firft waters fufficiently ftrong, are not proper fubjects for this procefs.

The mixture of water and oil which comes over, may either be feparated immediately by means of a feperatory, or after it has been put into large narrow-necked bottles, and placed in a cool

place, that the portion of oil which is not diſſolved in the water may riſe to the top, or ſink to the bottom, according to its ſpecific gravity. It is then to be ſeparated, either by a ſeparatory, (Plate I, fig. 10); or by means of a ſmall glaſs ſyringe; or by means of a filter of paper; or, laſtly, by means of a woollen thread, one end of which is immerſed in the oil, and the other lower end in a phial: the oil will thus paſs over into the phial by capillary attraction, and the thread is to be ſqueezed dry.

Moſt diſtilled waters, when firſt prepared, have a ſomewhat unpleaſant ſmell, which however they gradually loſe: it is therefore adviſable to keep them for ſome days after their preparation in veſſels but ſlightly covered; and not to cork them up until they loſe that ſmell.

That the waters may keep the better, about one twentieth part their weight of proof ſpirit may be added to each after they are diſtilled. I have been informed by a reſpectable apothecary, that if the ſimple diſtilled waters be rectified by diſtilling them a ſecond time, they will keep for ſeveral years without the addition of any ſpirit, which always gives an unpleaſant flavour, and is often objectionable for other reaſons.

Diſtilled waters are employed chiefly as grateful diluents, as ſuitable vehicles for medicines of greater efficacy, or for rendering diſguſtful ones more acceptable to the palate and ſtomach: few are depended on, with any intention of conſequence, by themſelves.

To the chapter on Simple Diſtilled Waters, the London college have annexed the following remarks.

We have ordered moſt of the waters to be diſtilled from the dried herbs, becauſe freſh are not ready at all times of the year. Whenever the freſh are uſed, the weights are to be increaſed. But, whether the freſh or dried herbs be employed, the operator may vary the weight according to the ſeaſon in which they have been produced and collected.

Herbs and ſeeds kept beyond the ſpace of a year, become leſs proper for the diſtillation of waters.

To every gallon of theſe waters add five ounces, by meaſure, of proof ſpirit.

The Edinburgh college order half an ounce of proof ſpirit to every pound of the water, which is nearly the ſame.

AQUA DISTILLATA. *Lond.*
Distilled Water.

Take of

Spring water, ten gallons.

Draw off by distillation, first, four pints; which being thrown away, draw off four gallons. This water is to be kept in a glass or earthen bottle, with a glass stopper.

Dub.

Take of

Spring water, twenty pounds.

Put it into a retort, and having thrown away the first pound, draw off ten pounds by distillation with a gentle heat.

Edin.

Let water be distilled in very clean vessels, until about two thirds have come over.

WATER is never found pure in a state of nature; and as it is absolutely necessary, particularly for many chemical operations, that it should be perfectly so, we must separate it from all heterogeneous matters by distillation. The first portion that comes over should be thrown away, not so much from the possibility of its being impregnated with volatile matters contained in the water, as from the probability that it will be contaminated with impurities it may have contracted in its passage through the worm in the refrigeratory. The distillation is not to be pushed too far, lest the water should acquire an empyreumatic flavour.

Although distilled water be necessary for many purposes, we apprehend that the London college, from a desire of extreme elegance, have fallen into a very considerable error in ordering it to be employed for many purposes, such as infusions and decoctions, for which good spring water would answer just as well, and for which, we will venture to say, that it never is employed by the apothecary. The consequence is, that the apothecary has no rule to direct him, when it is absolutely necessary, and when it may be dispensed with, and he will therefore probably dispense with it oftener than is proper.

AQUA CITRI AURANTII. *Edin.*
Orange-Peel Water.

Take of

Fresh orange-peel, two pounds.

Pour upon it as much water as shall be sufficient to prevent any empyreuma, after ten pounds have been drawn off by distillation. After due maceration, distil ten pounds.

AQUA FOENICULI DULCIS. *Dub. Lond.*
Fennel Water.

Take of
The bruiſed ſeeds of ſweet fennel, one pound;
Water, as much as may be ſufficient to prevent empyreuma.
Diſtil one gallon (ten pounds, *Dub.*)

IN the ſame quantity, and in the ſame manner, is to be diſtilled

ROSE WATER,
From ſix pounds of the recent petals, { *Aqua Roſæ Centifoliæ.* Edin. *Aqua Roſæ.* Lond. Dub.
Off. prep.—Ungt. adipis ſuill. *Lond.*

PEPPERMINT WATER,
From three pounds, *Aqua Menthæ Piperitæ.* Edin.
From one pound and a half, *Aqua Menthæ Piperitidis.* Lond. Dub.

PENNYROYAL WATER,
From three pounds in flower, *Aqua Menthæ Pulegii.* Edin.
From one pound and a half, *Aqua Pulegii.* Lond. Dub.

LEMON PEEL WATER,
Two pounds, *Aqua Citri Medicæ.* Edin.

SPEARMINT WATER,
One pound and a half, *Aqua Menthæ Sativæ.* Dub. Lond.

CINNAMON WATER,
From one pound bruiſed, *Aqua Lauri Cinnamoni.* Edin.
Do. macerated for a day, *Aqua Cinnamoni.* Lond. Dub.

CASSIA WATER,
One pound of bruiſed, *Aqua Lauri Caſſiæ.* Edin.

DILL WATER,
One pound bruiſed, *Aqua Anethi.* Lond.

PIMENTO WATER,
Half a pound bruiſed, *Aqua Myrti Pimentæ.* Edin.
Macerated for a day, *Aqua Pimento.* Lond.

THE virtues of all theſe waters are nearly alike; and the peculiarities of each will be eaſily underſtood by conſulting the account given in the Materia medica of the ſubſtance from which they are prepared. Mr. Nicholſon mentions, that as roſe water is exceedingly apt to ſpoil, the apothecaries generally prepare it in ſmall quantities at a time from the leaves, preſerved by packing them cloſely in cans with common ſalt. This we underſtand is

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not the practice in Edinburgh; and indeed cannot succeed with the petals of the damask rose, for they lose their smell by drying. The London apothecaries, therefore, probably use the red rose. The spoiling of some waters is owing to some mucilage carried over in the distillation; for, if rectified by a second distillation, they keep perfectly.

CHAP. XX.

VOLATILE OILS.

OLEA VOLATILIA. *Edin.*
Volatile Oils.

Volatile Oils are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped. The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom.

Besides, in preparing these distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example. Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

OLEA DISTILLATA. *Lond.*
Distilled Oils.

Let these oils be drawn off by distillation, from an alembic with a large refrigeratory; but, to prevent empyreuma, water must be added to the ingredients; in which they must be macerated before distillation.

The water which comes over with the oil in distillation is to be kept for use.

Dub.

Let the oil be extracted by distillation from the subject previously macerated in water, with the addition of as much water as may be sufficient to prevent empyreuma.

In distilling fennel, peppermint, spearmint, and pennyroyal, the water which comes over along with the oil is to be preserved for use in the manner directed in the chapter on Distilled Waters.

The herbs from which oils are to be extracted by distillation, are to be dried as soon as they are collected.

According to these directions, are prepared the

Volatile, Distilled, or Essential, OILS of	*OLEA Volatilia*, Edin. *Distillata*, Dub. *vel Essentialia*, Lond.
Anise,	*Pimpinellæ anisi.* Edin. *Anisi.* Lond. Dub.

Off. prep.—Tinct. opii ammon. *Ed.* Tinct. opii camph. *Lond. Dub.*

Caraway,	*Carui.* Lond. Dub.

Off. prep. Elect. sennæ, *Dub.* Elect. scammon. *Lond. Dub.* Pil. aloet, *Lond.*

Fennel seeds,	*Seminum fœniculi dulcis.* Dub.

from the Seeds.

Juniper berries,	*Juniperi communis.* Edin. *Baccarum juniperi.* Dub. *Juniperi Baccæ.* Lond.

from the Berries.

Pimento,	*Myrti pimentæ.* Edin.

from the Fruit.

Fennel flowers.	*Florum fœniculi dulcis.* Dub.
Rosemary,	*Rorismarini officinalis.* Edin. *Rorismarini.* Lond. Dub.

Off. prep.—Tinct. sapon. *Ed.* Linim sapon. *Dub.* Alcohol amm. arom. *Ed.*

Lavender,	*Lavandulæ spicæ.* Edin. *Lavandulæ.* Lond.

Off. prep.—Ungt. sulph. *Ed.*

Peppermint,	*Menthæ piperitæ.* Edin. ——— *piperitidis.* Lond. Dub.

Off. prep.—Pil rhoei comp. *Ed.*

Spearmint,	*Menthæ sativæ.* Lond. Dub.

Off. prep.—Ungt. lad. comp. *Lond.*

Pennyroyal,	*Pulegii.* Lond. Dub.
Origanum,	*Origani.* Lond. Dub.
Rue,	*Rutæ.* Dub.

Savine, { *Juniperi ſabinæ.* Ed. / *Sabinæ.* Dub. }

from the Flower, or Herb in flower. And of

Saſſafras, { *Lauri ſaſſafras.* Edin. / *Saſſafras.* Lond. }

from the Root.

OLEUM TEREBINTHINÆ. *Lond. Dub.*
Oil of Turpentine.

Take of
Common turpentine, five pounds.
Water, four pints, (four pounds, *Dub.*)
Diſtil (two pounds, *Dub.*) (the turpentine with the water in a copper alembic, *Lond.*) After the diſtillation of the oil, what remains, in the retort, is yellow reſin.

OLEUM VOLATILE PINI PURISSIMUM; olim OLEUM TEREBINTHINÆ PURISSIMUM. *Edin.* OLEUM TEREBINTHINÆ RECTIAT UM. *Lond. Dub.*
Rectified Oil of Turpentine.

Take of
Oil of turpentine, one pound, (two pounds, *Dub.*);
Water, four pints, (four pounds, *Dub.*)
Diſtil (a pound and a half, *Dub.*) (as long as any oil comes over, *Edin.*)

This proceſs is both tedious and accompanied with danger. It muſt be conducted with very great care; for the vapour, which is apt to eſcape through the junctures of the veſſels, is very inflammable. This rectified oil, which in many pharmacopœias is ſtyled Ethereal, is ſaid not to have its ſpecific gravity, ſmell, taſte, or medical qualities, much improved by this proceſs.

Med. uſe.—The Spirit of Turpentine, as this eſſential oil has been ſtyled, is frequently taken internally as a diuretic and ſudorific; and it has ſometimes a conſiderable effect when taken to the extent of a few drops only. It has, however, been given in much larger doſes, eſpecially when mixed with honey. Recourſe has principally been had to ſuch doſes in caſes of chronic rheumatiſm, particularly in thoſe modifications of it which are termed ſciatica and lumbago; but ſometimes they induce bloody urine.

Oil of turpentine, melted with as much ointment of yellow

reſin as is ſufficient to give it the conſiſtence of a liniment, conſtitutes the application to recent burns ſo ſtrongly recommended by Mr. Kentiſh. He firſt bathes the part with heated oil of turpentine, alcohol, or tincture of camphor, and then covers it up with rags dipped in the liniment, which are to be renewed one at a time, once a day. As the inflammation ſubſides, leſs ſtimulating applications are to be uſed; and when the ſecretion of pus commences, the parts are then to be covered with powdered chalk heated to the temperature of the body. In this way, he aſſures us that he cured very many extenſive burns in a few weeks, which, under the uſe of cooling applications, would have required as many months, or would have been altogether incurable.

The water employed in the diſtillation of volatile oils always imbibes ſome portion of the oil; as is evident from the ſmell, taſte, and colour, which it acquires. It cannot, however, retain above a certain quantity; and therefore, ſuch as has been already uſed and therefore almoſt ſaturated may be advantageouſly employed, inſtead of common water, in a ſecond, third, or any future, diſtillation of the ſame ſubject.

After the diſtillation of one oil, particular care ſhould be had to clean the worm perfectly before it be employed in the diſtillation of a different ſubſtance. Some oils, thoſe of wormwood and aniſeeds for inſtance, adhere to it ſo tenaciouſly, as not to be melted out by heat, or waſhed off by water: the beſt way of removing theſe, is to run a little of ſpirit of wine through it.

Volatile oils, after they are diſtilled, ſhould be ſuffered to ſtand for ſome days, in veſſels looſely covered with paper, till they have loſt their diſagreeable fiery odour, and become limpid: then put them up in ſmall bottles, which are to be kept quite full, cloſely ſtopped, in a cool place. With theſe cautions, they will retain their virtues in perfection for many years.

Moſt of the oils mentioned above, are prepared by our chemiſts in Britain, and are eaſily procurable in a tolerable degree of perfection: but the oils from the more expenſive ſpiceries, though ſtill introduced among the preparations in the foreign pharmacopœias, are, when employed among us, uſually imported from abroad.

Theſe are frequently ſo much adulterated, that it is not eaſy to meet with ſuch as are at all fit for uſe. Nor are theſe adulterations eaſily diſcoverable. The groſſer abuſes, indeed, may be readily detected. Thus, if the oil be mixed with alcohol, it will turn milky on the addition of water; if with expreſſed oils, alcohol will diſſolve the volatile, and leave the other behind: if with oil of turpentine, on dipping a piece of paper in the mixture, and

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drying it with a gentle heat, the turpentine will be betrayed by its ſmell. But the more ſubtile artiſts have contrived other methods of ſophiſtication, which elude all trials of this kind.

Some have looked upon the ſpecific gravity of oils as a certain criterion of their genuineneſs. This, however, is not to be abſolutely depended on; for the genuine oils, obtained from the ſame ſubjects, often differ in gravity as much as thoſe drawn from different ones. Cinnamon and cloves, whoſe oils uſually ſink in water, yield, if ſlowly and carefully diſtilled, oils of great fragrancy, which are ſpecifically lighter than the aqueous fluid employed in their diſtillation; whilſt, on the other hand, the laſt runnings of ſome of the lighter oils prove ſometimes ſo ponderous as to ſink in water.

As all volatile oils agree in the general properties of ſolubility in ſpirit of wine, indiſſolubility in water, miſcibility with water, by the intervention of certain intermedia, volatility in the heat of boiling water, &c. it is plain that they may be variouſly mixed with each other, or the dearer ſophiſticated with the cheaper, without any poſſibility of diſcovering the abuſe by any trials of this kind. And, indeed, it would not be of much advantage to the purchaſer, if he had infallible criteria of the genuineneſs of every individual oil. It is of as much importance that they be *good*, as that they be *genuine*; for genuine oils, from inattentive diſtillation, and long and careleſs keeping, are often weaker both in ſmell and taſte than the common ſophiſticated ones.

The ſmell and taſte ſeem to be the only certain teſts of which the nature of the thing will admit. If a bark ſhould have in every reſpect the appearance of good cinnamon, and ſhould be proved indiſputably to be the genuine bark of the cinnamon tree; yet if it want the cinnamon flavour, or has it but in a low degree, we reject it; and the caſe is the ſame with the oil. It is only from uſe and habit, or compariſons with ſpecimens of known quality, that we can judge of the goodneſs, either of the drugs themſelves, or of their oils.

Moſt of the volatile oils indeed, are too hot and pungent to be taſted with ſafety; and the ſmell of the ſubject is ſo much concentrated in them, that a ſmall variation in this reſpect is not eaſily diſtinguiſhed: but we can readily dilute them to any aſſignable degree. A drop of the oil may be diſſolved in ſpirit of wine, or received on a bit of ſugar, and diſſolved by that intermedium in water. The quantity of liquor which it thus impregnates with its flavour, or the degree of flavour which it communicates to a certain determinate quantity, will be the meaſure of the degree of goodneſs of the oil.

Medical uſe.—Volatile oils, medicinally conſidered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the ſubjects from which they are obtained, the oil being the direct principle in which the virtues, or at leaſt a conſiderable part of the virtues of the ſeveral ſubjects reſide. Thus, the carminative virtue of the warm ſeeds, the diuretic of juniper berries, the emmenagogue of ſavin, the nervine of roſemary, the ſtomachic of mint, the antiſcorbutic of ſcurvy graſs, the cordial of aromatics, &c. are ſuppoſed to be concentrated in their oils.

There is another remarkable difference in volatile oils, the foundation of which is leſs obvious, that of the degree of their pungency and heat. Theſe are by no means in proportion, as might be expected, to thoſe of the ſubject they were drawn from. The oil of cinnamon, for inſtance, is exceſſively pungent and fiery; in its undiluted ſtate it is almoſt cauſtic; whereas cloves, a ſpice which in ſubſtance is far more pungent than the other, yields an oil which is far leſs ſo. This difference ſeems to depend partly upon the quantity of oil afforded, cinnamon yielding much leſs than cloves, and conſequently having its active matter concentrated into a ſmaller volume; partly upon a difference in the nature of the active parts themſelves: for though volatile oils contain always the ſpecific odour, and flavour of their ſubjects, whether grateful or ungrateful, they do not always contain the whole pungency: this reſides frequently in a more fixed matter, and does not riſe with the oil. After the diſtillation of cloves, pepper, and ſome other ſpices, a part of their pungency is found to remain behind: a ſimple tincture of them in alcohol is even more pungent than their pure eſſential oils.

The more grateful oils are frequently made uſe of for reconciling to the ſtomach medicines of themſelves diſguſtful. It has been cuſtomary to employ them as correctors for the reſinous purgatives; an uſe to which they do not ſeem to be well adapted. All the ſervice they can here be of, is, to make the reſin ſit more eaſily at firſt on the ſtomach: far from abating the irritating quality upon which the violence of its operation depends, theſe pungent oils ſuperadd a freſh ſtimulus.

Volatile oils are never given alone, on account of their extreme heat and pungency; which in ſome is ſo great, that a ſingle drop let fall upon the tongue, produces a gangrenous eſchar. They are readily imbibed by pure dry ſugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of ſugar, they become ſoluble in aqueous liquors, and thus may be diluted to any aſſigned degree. Mucilages alſo render them miſcible with water into an uniform milky liquor. They diſſolve likewiſe in alcohol; the more fragrant in an equal weight, and

almoft all of them in lefs than four times their own quantity. Thefe folutions may be either taken on fugar, or mixed with fy-rups, or the like. On mixing them with water, the liquor grows milky, and the oil feparates.

The more pungent oils are employed externally againft paralytic complaints, numbnefs, pains, and aches, cold tumours, and in other cafes where particular parts require to be heated or ftimulated. The toothach is fometimes relieved by a drop of thefe almoft cauftic oils, received on cotton, and cautioufly introduced into the hollow tooth.

CHAP. XXI.

EMPYREUMATIC VOLATILE OILS.

Empyreumatic Oils agree in many particulars with the volatile oils already treated of, but they alfo differ from them in feveral important circumftances. The latter exift ready formed in the aromatic fubftances from which they are obtained, and are only feparated from the fixed principles by the action of a heat not exceeding that of boiling water. The former, on the contrary, are always formed by the action of a degree of heat confiderably higher than that of boiling water, and are the product of decompofition, and a new arrangement of the elementary principles of fubftances, containing at leaft oxygen, hydrogen, and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they do not differ very remarkably from the volatile oils, and are principally diftinguifhed from them by their unpleafant pungent empyreumatic fmell and rough bitterifh tafte. They are alfo more apt to fpoil by the contact of the air, and the oftner they are re-diftilled they become more limpid, lefs coloured, and more foluble in alcohol; whereas the effential oils, by repeated diftillations, become thicker and lefs foluble in alcohol.

Their action on the body is exceedingly ftimulant and heating.

OLEUM PETROLEI. *Lond.*
Oil of Petroleum.

Diftil petroleum in a fand bath.

The oil obtained from this bitumen will be more or lefs thin according to the continuance of the diftillation; and by its continuance the tar will at laft be reduced to a black coal; and then the oil will be pretty deep in colour, but perfectly fluid, though very acrid and ftimulating.

It is lefs difagreeable than fome of the other empyreumatic oils which had formerly a place in our pharmacopœias, fuch as the oleum lateritium.

OLEUM SUCCINI PURISSIMUM. *Edin.*
Purified Oil of Amber.

Diftil oil of amber in a glafs retort with fix times its quantity of water till two thirds of the water have paffed into the receiver; then feparate this very pure volatile oil from the water, and preferve it in clofe fhut veffels.

OLEUM SUCCINI RECTIFICATUM. *Lond.*
Rectified Oil of Amber.

Take of
Oil of amber, one pound.
Diftil three times.

Dub.

Take of
The oil which rifes in the preparation of falt of amber, three pounds.
Diftil a pound and a half.

The rectified oil has a ftrong bitumenous fmell, and a pungent acrid tafte. Given in a dofe of ten or twelve drops, it heats, ftimulates and promotes the fluid fecretions; it is chiefly celebrated in hyfterical diforders, and in deficiences of the uterine purgations. Sometimes it is ufed externally, in liniments for weak or paralytic limbs, and rheumatic pains.

Off. prep.—Spt. am. fuccin. *Lond.*

MOSCHUS ARTIFICIALIS.
Artificial Mufk.

By treating one part of oil of amber with four of nitrous acid, added in fmall portions at a time, and ftirring them together with a glafs rod, the oil is at laft converted into a yellow refin, having the fmell of mufk, and known in Germany by the name of Arti-

ficial muſk, where it is often uſed as a ſubſtitute for that expenſive drug.

OLEUM ANIMALE. *Lond.*
Animal Oil.

Take of
Oil of hartſhorn, one pound.
Diſtil three times.

OLEUM CORNU CERVINI RECTIFICATUM. *Dub.*
Rectified Oil of Hartſhorn.

Take of
The oil which aſcends in the diſtillation of the volatile liquor of hartſhorn, three pounds.
Water, ſix pounds.
Diſtil a pound and a half.

Animal Oil, thus rectified, is thin and limpid, of a ſubtle, penetrating, not diſagreeable, ſmell and taſte.

Medical uſe.—It is ſtrongly recommended as an anodyne and antiſpaſmodic in doſes of from 15 to 30 drops. Hoffman reports, that it procures a calm and ſweet ſleep, which continues often for 20 hours, without being followed by any languor or debility, but rather leaving the patient more alert and cheerful than before: that it procures likewiſe a gentle ſweat, without increaſing the heat of the blood: that given to 20 drops or more, on an empty ſtomach ſix hours before the acceſſion of an intermittent fever, it frequently removes the diſorder; and that it is likewiſe a very general remedy in inveterate and chronical epilepſies, and in convulſive motions, eſpecially if given before the uſual time of the attack, and preceded by proper evacuations. How far empyreumatic oils poſſeſs the virtues that have been aſcribed to them, has not yet been ſufficiently determined by experience; the tedioufneſs and trouble of the rectification having prevented their coming into general uſe, or being often prepared. They are liable alſo to more material inconvenience in regard to their medicinal uſe, namely, precariouſneſs in their quality; for how perfectly ſoever they may be rectified, they gradually loſe, in keeping, the qualities they had received from that proceſs, and return more and more towards their original fetid ſtate.

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CHAP. XXII.

DISTILLED SPIRITS.

THE flavour and virtues of diftilled waters are owing, as obferved in the preceeding chapter, to their being impregnated with a portion of the volatile oil of the fubject from which they are drawn. Alcohol, confidered as a vehicle for thefe oils, has this advantage above water, that it keeps all the oil that rifes with it perfectly diffolved into an uniform limpid liquor.

Neverthelefs, many fubftances, which, on being diftilled with water, impart to it their virtues in great perfection; if treated in the fame manner with alcohol, fcarcely give over to it any fmell or tafte. The caufe of this difference is, that alcohol is not fufceptible of fo great a degree of heat as water. It is obvious, therefore, that fome fubftances may be volatile enough to rife with the heat of boiling water, but not with that of boiling alcohol.

Thus, if cinnamon, for inftance, be committed to diftillation with a mixture of alcohol and water, or with proof-fpirit, which is no other than a mixture of about equal parts of the two; the alcohol will arife firft clear, colourlefs, and tranfparent, and almoft without any tafte of the fpice; but as foon as the more ponderous watery fluid begins to arife, the oil comes freely over with it, fo as to render the liquor highly odorous, fapid, and of a milky hue.

The proof fpirit ufually met with in the fhops is very rarely pure, or free from all unpleafant flavour; which, though concealed by means of certain additions, plainly difcovers itfelf when employed for the preparation of diftilled fpirits. This naufeous flavour does not begin to arife till after the alcohol has come over; which is the very time that the virtues of the ingredients begin alfo to arife moft plentifully; and hence the liquor receives an ungrateful taint. To this caufe principally is owing the general complaint, that the cordials of the apothecary are lefs agreeable than thofe of the fame kind prepared by the diftiller; the latter being extremely curious in rectifying or purifying the fpirits, which he ufes for what he calls fine goods, from all unpleafant flavour.

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SPIRITUS CARI CARVI. *Edin.*
Spirit of Caraway.

Take of
Caraway ſeeds, bruiſed, half a pound;
Diluted alcohol, nine pounds.
Macerate for two days in a cloſe veſſel; then pour on as much water as will prevent empyreuma, and draw off by diſtillation nine pounds.

SPIRITUS CARVI. *Lond. Dub.*
Spirit of Caraway.

Take of
Caraway ſeeds, bruiſed, half a pound;
Proof ſpirit of wine, one gallon; (nine pounds, *Dub.*)
Water, ſufficient to prevent empyreuma.
Draw off one gallon, (nine pounds, *Dub.*)

In the ſame manner is prepared the ſame quantity of ſpirit from

	Spiritus.
Cinnamon, bruiſed, one pound,	Lauri Cinnamoni. *Edin.* *Cinnamoni.* Lond. Dub.
Peppermint, in flower, one pound and a half.	*Menthæ Piperitæ.* Edin. ——— *Piperitidis.* Lond.
Spearmint, one pound and a half,	*Menthæ ſativæ.* Lond.
Pennyroyal, dried, a pound and a half.	*Pulegii.* Lond.
Nutmeg, well bruiſed, two ounces, *Off. prep.*—Succus coch. comp. *Ed.*	*Myriſticæ moſchatæ.* Edin. *Nucis moſchatæ.* Dub. Lond.
Pimento, bruiſed, half a pound,	*Myrti Pimentæ.* Edin. *Pimento.* Dub. Lond.

SPIRITUS LAVANDULÆ SPICÆ. *Ed.*
Spirit of Lavender.

Take of
Flowering ſpikes of lavender, freſh gathered, two pounds;
Alcohol, eight pounds.
Draw off by the heat of boiling water, ſeven pounds.

SPIRITUS LAVENDULÆ. *Lond. Dub.*
Spirit of Lavender.

Take of
Freſh flowers of lavender, one pound and a half;

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Proof ſpirit of wine, one gallon, (nine pounds, *Dub.*)
Draw off by diſtillation in a water bath, five pints, (five pounds, *Dub.*

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Linim. camph. comp. *Lond. Dub.*

By theſe directions, and in the ſame quantities, is prepared,

SPIRITUS RORISMARINI OFFICINALIS. *Ed.* SPIRITUS RORISMARINI. *Lond.*
Spirit of Roſemary,

from two pounds of the flowering tops of roſemary, according to the Edinburgh college, and from a pound and a half according to the London.

Off. prep.—Linim ſapon, comp. *Lond.*

We think it unneceſſary to make particular obſervations on each of theſe ſimple ſpirits, as their virtues are the ſame with thoſe of the ſubſtances from which they are extracted, united to the ſtimulus of the alcohol. The alcohol in the ſpirits of lavender and roſemary, is almoſt pure; in the others it is diluted with about an equal weight of water.

SPIRITUS ANISI COMPOSITUS. *Lond.*
Compound Spirit of Aniſeed.

Take of
Aniſeed,
Angelica ſeed, of each, bruiſed, half a pound;
Proof ſpirit, one gallon;
Water, ſufficient to prevent empyreuma.
Draw off one gallon by diſtillation.

This compound ſpirit, like the ſimple ones, is an agreeable cordial; indeed too agreeable, for by ſome they are ſo often reſorted to, on the ſlighteſt ſenſation of flatulence in the ſtomach, that their uſe is attended with all the pernicious conſequences of dram drinking.

SPIRITUS JUNIPERI COMMUNIS COMPOSITUS. *Ed.*
SPIRITUS JUNIPERI COMPOSITUS. *Lond. Dub.*
Compound Spirit of Juniper.

Take of
Juniper berries, well bruiſed, one pound;
Caraway ſeeds,
Sweet fennel ſeeds, each, bruiſed, one ounce and a half;

Diluted alcohol, nine pounds, (one gallon, *Lond.*)
Macerate for two days, and having added as much water as will prevent empyreuma, draw off by diſtillation nine pounds. *Ed.* (one gallon, *Lond.*)

THE good and bad effects of this ſpirit exactly coincide with thoſe of gin.

SPIRITUS RAPHANI COMPOSITUS. *Lond. Dub.*

Compound Spirit of Horſe-Radiſh.

Take of
Freſh horſe-radiſh root,
Dried outer rind of Seville oranges, each two pounds;
Freſh herb of garden ſcurvy-graſs, four pounds;
Bruiſed nutmegs, one ounce;
Proof ſpirit, two gallons, (eighten pounds, *Dub.*)
Water, ſufficient to prevent empyreuma.
Draw off two gallons, (eighteen pounds, *Dub.*)

THIS is an aromatic acrid ſpiritous liquor, but has no pretenſions to the ſpecific antiſcorbutic properties formerly aſcribed to it.

ALCOHOL AMMONIATUM FŒTIDUM, SIVE SPIRITUS AMMONIÆ FOETIDUS. *Ed.* SPIRITUS ALCALI VOLATILIS FOETIDUS. *Dub.*

Fetid Spirit of Volatile Alkali.

Take of
Spirit of ammonia, eight ounces, (ten ounces, *Dub.*)
Aſſa fœtida, half an ounce.
Digeſt in a cloſe veſſel twelve hours; then diſtil off, with the heat of boiling water, eight ounces.

SPIRITUS AMMONIÆ FOETIDUS. *Lond.*

Fetid Spirit of Ammonia.

Take of
Proof ſpirit, ſix pints;
Sal ammoniac, one pound;
Aſſa fœtida, four ounces.
Potaſh, one pound and a half.
Mix them, and draw off by diſtillation five pints, with a ſlow fire.

THIS ſpirit, the laſt formula of which is the beſt, as being moſt eaſily prepared, is deſigned as an anti-hyſteric, and is undoubtedly a very elegant one. Volatile ſpirits, impregnated for thaſe

purposes with different fetids, have been usually kept in the shops; the ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping.

CHAP. XXIII.

INFUSIONS.

We have already explained the sense in which we employ the term Infusion. We confine it to the action of a menstruum, not assisted by ebullition, on any substance consisting of heterogeneous principles, some of which are soluble, and others insoluble, in that menstruum. The term is generally used in a more extensive, but we are inclined to think, a less correct, sense: thus, lime water and the mucilages, which are commonly classed with the infusions, are instances of simple solution, and the chalk mixture is the mechanical suspension of an insoluble substance. When the menstruum used is water, the solution is termed simply an Infusion; but when the menstruum is alcohol, it is called a Tincture; when wine or vinegar, a Medicated Wine or Vinegar. Infusions in water are extremely apt to spoil, and are generally extemporaneous preparations.

INFUSUM CINCHONÆ OFFICINALIS. *Ed.*
Infusion of Cinchona Bark.

Take of
- Peruvian bark in powder, one ounce;
- Water, one pound.

Macerate for twenty-four hours, and filter.

INFUSUM CORTICIS PERUVIANI. *Dub.*
Infusion of Peruvian Bark.

Take of
- Peruvian bark, in coarse powder, one ounce;
- Mucilage of gum-arabic, two ounces;
- Water, twelve ounces.

Triturate the bark with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This is a very elegant form of exhibiting the active principles of cinchona bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration directed by the Dublin college will promote the solution, and the addition of the mucilage, will suspend the finest particles of the substance of the bark itself. The residuum of the cold infusion may be afterwards employed in making other preparations, especially the extract, for its virtues are by no means exausted. But it must never be dried and sold, or exhibited in substance, for that would be a culpable fraud.

INFUSUM DIGITALIS PURPUREÆ. *Ed.*

Infusion of Foxglove.

Take of

Dried leaves of foxglove, one drachm;
Boiling water, eight ounces;
Spirit of cinnamon, one ounce.

Macerate for four hours, and filter.

This is the infusion so highly recommended by Withering. Half an ounce, or an ounce, of it, may be taken twice a-day in dropsical complaints. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

INFUSUM GENTIANÆ COMPOSITUM; vulgo Infusum Amarum. *Ed.*

Compound Infusion of Gentian, or Bitter Infusion.

Take of

Gentian root, cut into pieces, half an ounce;
Dried peel of Seville oranges, bruised, one drachm;
Coriander seeds, bruised, half a drachm;
Diluted alcohol, four ounces;
Water, one pound.

First pour on the alcohol, and three hours thereafter add the water; then macerate without heat for twelve hours, and strain.

Infusum Gentianæ Compositum. *Lond.*

Compound Infusion of Gentian.

Take of

The root of gentian, cut into pieces, one drachm.

Dried orange-peel, a drachm and a half;
Fresh outer rind of lemons, half an ounce;
Boiling water, twelve ounces by measure.
Macerate for an hour, and strain.

Dub.

Take of
Bruised gentian root, two drachms;
Fresh outer rind of lemons, half an ounce;
Dried peel of Seville oranges, a drachm and a half;
Diluted alcohol, four ounces;
Boiling water, twelve ounces.
First pour on the spirit, and after three hours, the water. Lastly, after macerating two hours, filter.

These formulæ are all essentially the same. The Edinburgh college employ the largest proportion of gentian; but they infuse it in cold water, which does not extract the bitter principle so quickly or so fully as boiling water, although it dissipates less of the flavour of the aromatics. The alcohol is a useful addition, both in promoting the extraction of the virtues of all the ingredients, and in preserving the infusion longer from spoiling.

Med. use.—Gentian is the strongest and purest of the European bitters, and readily imparts its virtues to water. These infusions are in very common use as stomachic and tonic.

INFUSUM MIMOSÆ CATECHU; vulgo Infusum Japonicum. *Ed.*

Infusion of Catechu, commonly called *Japonic Infusion.*

Take of
Extract of catechu in powder, two drachms and a half;
Cinnamon, bruised, half a drachm;
Boiling water, seven ounces;
Simple syrup, one ounce.
Macerate the extract and cinnamon in the water, in a covered vessel, for two hours, then strain it, and add the syrup.

As this preparation will not keep above a day or two, it must always be made extemporaneously. The two hours maceration, therefore, becomes very often extremely inconvenient; but it may be prepared in a few minutes by boiling, without in the least impairing the virtues of the medicine.

Med. use.—Extract of catechu is almost pure tannin. This infusion is therefore a powerfully astringent solution. The cinnamon and syrup render it sufficiently agreeable, and it will be

found ſerviceable in diarrhœas proceeding from a laxity of the inteſtines. Its doſe is a ſpoonful or two every other hour, or after every looſe ſtool.

INFUSUM RHEI PALMATI. *Ed.*
Infuſion of Rhubarb.

Take of
Rhubarb, bruiſed, half an ounce;
Boiling water, eight ounces;
Spirit of cinnamon, one ounce.
Macerate the rhubarb in a cloſe veſſel with the water, for twelve hours; then add the ſpirit, and ſtrain the liquor.

This appears to be one of the beſt preparations of rhubarb, when deſigned as a purgative; water extracting its virtue more effectually than either vinous or ſpirituous menſtrua.

INFUSUM ROSÆ GALLICÆ. *Ed.*
Infuſion of Roſes.

Take of
The petals of red roſes, dried, one ounce;
Boiling water, five pounds;
Sulphuric acid, one drachm;
White ſugar, two ounces.
Macerate the petals with the boiling water in an earthen veſſel, which is not glazed with lead, for four hours; then add the acid, ſtrain the liquor, and diſſolve the ſugar in it.

INFUSUM ROSÆ. *Lond.*
Infuſion of Roſes.

Take of
Dried red roſes, half an ounce;
Diluted vitriolic acid, three drachms;
Boiling diſtilled water, two pints and a half;
Double refined ſugar, an ounce and a half.
Firſt pour the water on the petals in a glaſs veſſel, then add the diluted vitriolic acid, and macerate for half an hour. Strain the liquor, when cold, and add the ſugar.

INFUSUM ROSARUM; olim, TINCTURA ROSARUM. *Dub.*
Infuſion of Roſes, formerly *Tincture of Roſes.*

Take of
The petals of red roſe buds, half an ounce;
Diluted vitriolic acid, three drachms;
Boiling water, three pounds;
Double refined ſugar, an ounce and a half.

First mix the acid with the water, in a glaſs or glazed earthen veſſel. Macerate the petals in the mixture, then add the ſugar to the liquor when cold and ſtrained.

The difference in the directions for preparing this infuſion are immaterial. In fact, the roſe leaves have very little effect, except in giving the mixture an elegant red colour. Its ſub-acid and aſtringent virtues depend entirely on the ſulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all caſes which require mild coolers and ſub-aſtringents: it is ſometimes taken with boluſes or electuaries of the bark, and likewiſe makes a good gargle.

INFUSUM SENNÆ SIMPLEX. *Lond.*
Simple Infuſion of Senna.

Take of
- Senna, an ounce and a half;
- Ginger, powdered, one drachm;
- Boiling diſtilled water, one pint.

Macerate them for an hour in a covered veſſel, and ſtrain the liquor when cold.

Infusum Sennæ. *Dub.*
Infuſion of Senna.

Take of
- Senna, ſix drachms;
- Ginger, powdered, half a drachm;
- Boiling water, ten ounces.

Macerate them for an hour in a covered veſſel, then filter.

This is a well contrived purgative infuſion, the ginger correcting the draſtic effects of the ſenna. But the quantity here ordered to be prepared at one time, is much too large, for an ounce as two is a ſufficient doſe. It is of advantage that it ſhould be uſed freſh prepared, as it is apt to ſpoil very quickly.

INFUSUM SENNÆ TARTARISATUM. *Lond.*
Tartariſed Infuſion of Senna.

Take of
- Senna, one ounce and a half;
- Coriander ſeeds, bruiſed, half an ounce;
- Cryſtals of tartar, two drachms;
- Diſtilled water, one pint.

Diſſolve the cryſtals of tartar by boiling in the water; then pour

the liquor, as yet boiling, on the ſenna and ſeeds. Macerate for an hour in a covered veſſel, and ſtrain when cold.

THE addition of the ſuper tartrate of potaſs renders the taſte of the ſenna leſs unpleaſant, and alſo promotes its action.

INFUSUM TAMARINDI CUM SENNA. *Edin.*
Infuſion of Tamarinds and Senna.

Take of
Preſerved tamarinds, one ounce;
Senna, one drachm;
Coriander ſeeds, bruiſed, half a drachm;
Brown ſugar, half an ounce;
Boiling water, eight ounces.

Macerate for four hours, with occaſional agitation, in a cloſe earthen veſſel, not glazed with lead, and ſtrain the liquor.

It may alſo be made with double, triple, &c. the quantity of ſenna.

THIS forms a mild and uſeful purge, excellently ſuited for delicate ſtomachs, and inflammatory diſeaſes. The taſte of the ſenna is well covered by the aromatic ſugar and by the acidity of the tamarinds.

CHAP. XXIV.

DECOCTIONS.

DECOCTIONS differ from infuſions only in the action of the menſtruum being aſſiſted by a boiling heat. At the ſame time, however, that the increaſe of temperature facilitates and expedites the ſolution of ſome fixed principles, it gives others a tendency to decompoſition, and diſſipates all volatile matters. Decoction, therefore, can only be uſed with advantage for the extraction of principles which are neither volatilized nor altered by a boiling heat.

To promote the action of the menſtruum, infuſion is ſometimes premiſed to decoction.

In compound decoctions, it is ſometimes convenient not to put in all the ingredients from the firſt, but in ſucceſſion, according to their hardneſs, and the difficulty with which their virtues are extracted; and if any aromatic, or other ſubſtances containing

volatile principles, enter into the compofition, the boiling decoction is to be fimply poured upon them, and covered up until it cool.

Decoctions fhould be made in veffels fufficiently large to prevent any rifk of boiling over, and fhould be continued without interruption, and gently.

DECOCTUM ALTHÆÆ OFFICINALIS. *Ed.*
Decoction of Marfhmallows.

Take of
Dried marfhmallow roots, bruifed, four ounces;
Raifins of the fun, ftoned, two ounces;
Water, feven pounds.
Boil down to five pounds; ftrain the decoction, and after the feces have fubfided, pour of the clear liquor.

MARSHMALLOW roots contain nothing foluble in water except mucilage, which is very abundant in them. This decoction is therefore to be confidered merely as an emollient, rendered more pleafant by the acidulous fweetnefs of the raifins.

DECOCTUM ANTHEMIDIS NOBILIS; vulgo, DECOCTUM CHAMÆMELI five COMMUNE. *Ed.*
Common Decoction, or Decoction of Chamomile.

Take of
Chamomile flowers, dried, one ounce;
Caraway feeds, bruifed, half an ounce;
Water, five pounds.
Boil for a quarter of an hour, and ftrain.

DECOCTUM CHAMÆMELI; five DECOCTUM PRO ENEMATE. *Dub.*
Decoction of Chamomile, or Decoction for Glyfters.

Take of
Chamomile flowers, dried, half an ounce;
Sweet fennel feeds, two drachms;
Water, a pound.
Boil a little, and ftrain.

DECOCTUM PRO ENEMATE. *Lond.*
Decoction for Glyfters.

Take of
The leaves of mallow, dried, one ounce;
Chamomile flowers, dried, half an ounce;
Water, one pint.
Boil, and ftrain,

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DECOCTUM PRO FOMENTO. *Lond.*
Decoction for Fomentations.

Take of
The leaves of ſouthernwood, dried,
The tops of ſea wormwood, dried,
Chamomile flowers, dried, each one ounce;
Bay leaves, dried, half an ounce;
Diſtilled water, ſix pints.
Boil them a little, and ſtrain.

THESE decoctions are merely ſolutions of bitter extractive, combined, in the ſecond with mucilage, and in the others with eſſential oils. In making them, the aromatic ſubſtances ſhould not be added until the decoction is nearly completed; for otherwiſe their flavour would be entirely diſſipated.

It muſt, however, be acknowledged, that theſe impregnations are for the moſt part unneceſſary for the purpoſe of glyſters; and in general, the bulk and warmth of theſe produce a diſcharge before theſe medicines can have any effect.

As fomentations, their virtues alſo depend in a great meaſure on the warm water, of which they principally conſiſt: and when the herbs themſelves are applied, they act only as retaining heat and moiſture for a longer time; and are a leſs convenient, and not more uſeful fomentation, than cloths wrung out of hot water.

DECOCTUM CINCHONÆ OFFICINALIS; vulgo DECOCTUM CORTICIS PERUVIANI. *Edin.*
Decoction of Cinchona Bark,

Take of
Cinchona bark, in powder, one ounce;
Water, a pound and a half.
Boil for ten minutes in a covered veſſel, and ſtrain the liquor while hot.

DECOCTUM CORTICIS PERUVIANI. *Lond.*
Decoction of Peruvian Bark.

Take of
Peruvian bark, powdered, one ounce;
Diſtilled water, one pint and three ounces.
Boil for ten minutes in a covered veſſel, and ſtrain the liquor while hot.

Dub.

Take of
Peruvian bark, in coarſe powder, ſix drachms;
Water, eighteen ounces.

Boil for ten minutes in a veſſel almoſt covered, and ſtrain the liquor, while hot, through linen.

Cinchona bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining diſſolved; therefore, when a ſaturated decoction cools, it becomes turbid, and there is always a depoſition of a yellowiſh or reddiſh powder, while the ſupernatant liquor is reduced to the ſtrength of a ſaturated cold infuſion. Decoction therefore preſents us with an eaſy means of obtaining immediately an active preparation of cinchona bark, and with one of greater ſtrength, than a cold or even a warm infuſion, provided it be drunk while tepid, and before it forms any depoſition, or if the precipitate be diffuſed by agitation, after it is formed. As the precipitate contains no woody fibre, or other inert matter, it is extremely probable that in very ſmall doſes it would prove, if dried, a very powerful preparation of cinchona bark.

Formerly it was ſuppoſed that the ſtrength of a decoction of cinchona bark, and ſimilar ſubſtances, was increaſed by continuing the boiling for a great length of time; but this is now known to be a miſtake; and indeed, after a certain time, the decoction becomes weaker inſtead of ſtronger, becauſe water at different temperatures is capable of diſſolving only a determinate proportion of its active principles; and therefore, as ſoon as it is ſaturated, any farther decoction is unneceſſary. But moreover, theſe principles, when diſſolved in water, are liable to be decompoſed, and become inert, by the abſorption of atmoſpheric oxygen, and this decompoſition is increaſed by increaſe of temperature; and as boiling conſtantly preſents new ſurfaces to the action of the air, it is evidently hurtful when protracted longer than what is juſt neceſſary to ſaturate the water. Ten minutes is ſuppoſed by the colleges to be ſufficient for that purpoſe.

DECOCTUM DAPHNES MEZEREI. *Ed.*

Decoction of Mezereon.

Take of
- The bark of mezereon root, two drachms;
- Liquorice root, bruiſed, half an ounce;
- Water, three pounds.

Boil with a gentle heat, down to two pounds, and ſtrain the decoction.

From four to eight ounces of this decoction may be given four

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times a-day, in ſome obſtinate venereal and rheumatic affections. It operates chiefly by perſpiration.

DECOCTUM GEOFFRÆÆ INERMIS. *Ed.*

Decoction of Cabbage-tree Bark.

Take of

Bark of the cabbage-tree, powdered, one ounce;
Water, two pounds.

Boil with a gentle fire down to one pound, and ſtrain the decoction.

THIS is a powerful anthelmintic. It may be given in doſes of one table ſpoonful to children, and four to adults. If diſagreeable ſymptoms ſhould ariſe from an over-doſe, or from drinking cold water during its action, we muſt immediately purge with caſtor oil, and dilute with acidulated fluids.

DECOCTUM GUAIACI COMPOSITUM; vulgo DECOCTUM LIGNORUM. *Ed.*

Compound Decoction of Guaiacum, commonly called *Decoction of the Woods.*

Take of

Guaiacum raſpings, three ounces;
Raiſins, ſtoned, two ounces;
Saſſafras root, ſliced,
Liquorice root, bruiſed, each one ounce;
Water, ten pounds.

Boil the guaiacum and raſins with the water, over a gentle fire, to the conſumption of one half, adding towards the end, the ſaſſafras and liquorice, and ſtrain the decoction without expreſſion.

THIS decoction is of uſe in ſome rheumatic and cutaneous affections. It may be taken by itſelf, to the quantity of a quarter of a pint twice or thrice a-day, or uſed as an aſſiſtant in a courſe of mercurial or antimonial alteratives, the patient, in either caſe, keeping warm, in order to promote the operation of the medicine.

DECOCTUM HELLEBORI ALBI. *Lond.*

Decoction of White Hellebore.

Take of

The root of white hellebore, powdered, one ounce;

Diſtilled water, two pints;
Rectified ſpirit of wine, two ounces.
Boil the water with the root to one pint, and, the liquor being cold and ſtrained, add to it the ſpirit.

THIS decoction is only uſed externally as a waſh, in tinea capitis, lepra, pſora, &c. When the ſkin is very tender and irritable, it ſhould be diluted wiih an equal quantity of water.

DECOCTUM HORDEI DISTICHI. *Ed.* DECOCTUM HORDEI. *Lond.*
Decoction of Barley. Barley Water.

Take of
Pearl barley, two ounces;
Water, five pounds.
Firſt waſh off the mealy matter which adheres to the barley with ſome cold water; then extract the colouring matter by boiling it a little with about half a pound of water. Throw this decoction away; and put the barley thus purified into five pounds of boiling water, which is to be boiled down to one half, and ſtrain the decoction.

DECOCTUM HORDEI COMPOSITUM. *Lond.*
Compound Decoction of Barley.

Take of
The decoction of barley, two pints;
Figs, ſliced, two ounces;
Liquorice root, ſliced and bruiſed, half an ounce;
Raiſins, ſtoned, two ounces;
Diſtilled water, one pint.
Boil to two pints, and ſtrain.

THESE liquors are to be uſed freely, as diluting drinks, in fevers and other acute diſorders: hence it is of conſequence that they ſhould be prepared ſo as to be as elegant and agreeable as poſſible: for this reaſon they are inſerted in the pharmacopœia, and the ſeveral circumſtances which contribute to their elegance ſet down, for if any one of them be omitted, the beverage will be leſs grateful. As however they are much oftener prepared by nurſes and ſervants than by the apothecary, theſe receipts might with great advantage be ſubſtituted for the ridiculous, and often dangerous ſpecifics, with which domeſtic cookery books abound. We would therefore recommend this ſubject to the notice of the ingenious and ſcientific author of *Culina Famulatrix Medicinæ*, than whom, no one is more qualified, with the aſſiſtance of Archæus,

to reform Domeftic Pharmacy. However trivial medicines of this clafs may appear to be, they are of greater importance in the cure of acute difeafes than many more elaborate preparations.

DECOCTUM POLYGALÆ SENEGÆ. *Ed.*

Decoction of Seneka.

Take of

Seneka root, one ounce;

Water, two pounds.

Boil down to fixteen ounces, and ftrain the decoction.

The virtues of this decoction will be eafily underftood from thofe of the root from which it is prepared. The dofe in hydropic cafes, and rheumatic or arthritic complaints, is two ounces, three or four times a-day, according to its effect.

DECOCTUM SIMILACIS SARSAPARILLÆ. *Ed.* DECOCTUM SARSAPARILLÆ. *Lond. Dub.*

Decoction of Sarfaparilla.

Take of

The root of farfaparilla, fliced, fix ounces;

Diftilled water, eight pints.

Digeft for two hours, with a heat of about 195°; then take out the root, and bruife it; repeat the maceration for the fame length of time, and in the fame liquor, with the bruifed root. Then boil the liquor down to four pints, prefs it out, and ftrain the decoction.

The above formula is that of the London college; and as that of the Edinburgh college differs from it only in omitting the fecond maceration, and that of the Dublin in not expreffing the temperature in which it is to be performed, it was thought unneceffary to introduce them. It is indeed a very doubtful remedy, and its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing fyphilis; but by fome it is thought ufeful in the fequelæ of that difeafe.

DECOCTUM SARSAPARILLÆ COMPOSITUM. *Lond. Dub.*

Compound Decoction of Sarfaparilla.

Take of

The root of farfaparilla, fliced and bruifed, fix ounces;

Bark of the root of faffafras,

Shavings of guaiacum wood,

Liquorice root, bruifed, of each one ounce;

Mezereon, three drachms ;
Diſtilled water, ten pints.
Macerate, with a gentle heat, for ſix hours; then boil it down to fivepints, adding, towards the end of the boiling, the mezereon, and ſtrain the liquor.

THE directions of the Dublin college only differ in adding the liquorice root along with the mezereon, and in reducing the quantity of the ingredients uſed to one fourth part.

This compound decoction is ſaid to be an improved mode of preparing the once highly celebrated Liſbon diet drink, which, after its firſt introduction into Britain, was ſo long kept a ſecret.

It operates as a diaphoretic, and may be given with advantage in rheumatic caſes, and in ſome of the ſequelæ of ſyphilis. Three or four ounces may be taken four times a-day.

DECOCTUM ULMI. *Lond.*
Decoction of Elm.

Take of
The freſh inner bark of elm, bruiſed, four ounces ;
Diſtilled water, four pints ;
Boil to two pints, and ſtrain.

Under this form the elm bark has been highly celebrated for the cure of certain cutaneous eruptions ; but undeſervedly, according to the experience of the moſt judicious practitioners.

CHAP. XXV.

MUCILAGES.

MUCILAGO AMYLI. *Ed. Lond.*
Mucilage of Starch.

Take of
Starch, half an ounce ;
Water, one pound.
Triturate the ſtarch, gradually adding the water ; then boil them a little.

The London college uſe only three drachms of ſtarch to one pound of water. The mucilage thus formed is very uſeful in thoſe caſes where a glutinous ſubſtance is required; it is often ſucceſsfully employed as a glyſter, in diarrhœas depending on acrimony in the inteſtines.

MUCILAGO ASTRAGALI TRAGACANTHÆ. *Ed.*
Mucilage of Gum Tragacanth.

Take of
Gum tragacanth, in powder, one ounce;
Boiling water, eight ounces.
Macerate for twenty-four hours; then triturate carefully, that the gum may be diſſolved; and preſs the mucilage through linen cloth.

MUCILAGO TRAGACANTHÆ. *Lond.*
Mucilage of Tragacanth.

Take of
Tragacanth, half an ounce:
Diſtilled water, ten ounces, by meaſure.
Macerate them, with a gentle heat, till the tragacanth be diſſolved.

MUCILAGO GUMMI TRAGACANTHÆ. *Dub.*
Mucilage of Tragacanth.

Take of
Gum tragacanth, in powder, one drachm;
Boiling water, eight ounces.
Diſſolve the gum by digeſtion; then ſtrain the mucilage through linen.

Gum Tragacanth is difficultly ſoluble in water. When macerated in it, it ſwells, but does not diſſolve. To effect the ſolution it muſt be beaten into a paſte with ſome of the water; and the reſt of the water muſt be added gradually, and incorporated with the paſte by beating them together. Gum tragacanth is a very tenacious ſubſtance, and requires a very large proportion of water to form a fluid mucilage. That of the Edinburgh college, which is made with eight parts of water to one of the gum, is a paſte rather than a mucilage. The London mucilage is made with twenty parts of water, and the Dublin with ſixty-four.

MUCILAGO MIMOSÆ NILOTICÆ. *Ed.*
Mucilage of Gum Arabic.

Take of
Gum Arabic, in powder, one part;

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Boiling water, two parts.

Digeſt with frequent agitation, until the gum be diſſolved; then preſs the mucilage through linen.

MUCILAGO ARABICI GUMMI. *Lond.*
Mucilage of Gum Arabic.

Take of
Gum-arabic, in powder, four ounces;
Boiling diſtilled water, eight ounces.

Triturate the gum with the water until it be diſſolved.

Dub.

Take of
Gum-arabic, in powder, four ounces;
Boiling water, nine ounces.

Triturate the gum with the water, then preſs the mucilage through linen.

IT is very neceſſary to paſs the mucilage through linen, in order to free it from pieces of wood and other impurities, which always adhere to the gum: the linen may be placed in a funnel.

Mucilage of gum arabic is very uſeful in many operations in pharmacy; it is alſo much uſed for properties peculiar to thoſe ſubſtances of its own claſs, and of all the gums it ſeems to be the pureſt.

Off. prep.—Inf. cort. Peruv. *Dub.* Emulſio Arabica. *Edin.* Potio carb. calcis. *Ed.*

MUCILAGO SEMINUM CYDONII MALI. *Lond.*
Mucilage of Quince-Seed.

Take of
Quince-ſeeds, one drachm;
Diſtilled water, eight ounces, by meaſure.

Boil with a ſlow fire for ten minutes; then paſs it through linen.

THIS mucilage, though ſufficiently agreeable, is perfectly ſuperfluous, eſpecially as it is apt to ſpoil, from being mixed with the other principles of the ſeeds ſoluble in water. It is, beſides, never ſo tranſparent as mucilage carefully prepared from gum arabic, is not cheaper, and is unfit for many purpoſes, being coagulated by acids.

CHAP. XXVI.

S Y R U P S.

SYRUPI. *Lond. Dub.*
Syrups.

In making ſyrups, where we have not directed either the weight of the ſugar, or the manner in which it ſhould be diſſolved, this is to be the rule:

Take of
Double refined ſugar, twenty-nine ounces;
Any kind of liquor, one pint, (one pint and a half, *Dub.*)

Diſſolve the ſugar in the liquor, in a water bath; (mix and boil down to one pound, *Dub.*) then ſet it aſide for twenty-four hours; take off the ſcum, and pour off the ſyrup from the feces, if there be any.

Syrups are ſolutions of ſugar in any watery fluid, whether ſimple or medicated. Simple ſyrup is nutritious and demulcent. When made of fine ſugar, it is tranſparent and colourleſs. If neceſſary, it is eaſily clarified, by beating to a froth the white of an egg with three or four ounces of water, mixing it with the ſyrup, and boiling the mixture for a few ſeconds, until the albumen coagulates, and enveloping all heterogenous matters, forms a ſcum, which may be eaſily taken off, or ſeparated by filtration. When inſtead of ſimple water, any other fluid is uſed for diſſolving the ſugar, the ſyrup is then medicated. Medicated ſyrups are prepared, either with expreſſed juices, infuſions, decoctions, or ſaline fluids. The object of forming theſe into ſyrups, is either to render them agreeable to the palate, or to preſerve them from fermentation. In the latter caſe, the quantity of ſugar added becomes a matter of great importance; for, if too much be employed, the ſugar will ſeparate by cryſtallization; and if too little, inſtead of preventing fermentation, it will accelerate it. About two parts of ſugar to one of fluid are the proportions directed by the Britiſh colleges with this view. But, as in ſome inſtances, a larger quantity of fluid is added, and afterwards reduced to the proper quantity by decoction, it will not be ſuperfluous to point out ſome circumſtances, which ſhew the evapora-

tion to be carried far enough. Theſe are the tendency to form a pellicle on its ſurface, when a drop of it is allowed to cool; the receding of the laſt portion of each drop, when poured out drop by drop, after it is cold; and, what is moſt to be relied on, its ſpecific gravity when boiling hot, being about 1.3, or 1.385, when cold. The ſyrup which remains, after all the cryſtallizable ſugar has been ſeparated from it, has been much, and probably juſtly, recommended by ſome for the preparation of medicated ſyrups and electuaries, although its pharmaceutical ſuperiority is actually owing to its impurity.

SYRUPUS SIMPLEX SIVE COMMUNIS. *Ed.*
Simple or *Common Syrup.*

Take of
Double refined ſugar, in powder, fifteen parts;
Water, eight parts.
Let the ſugar be diſſolved by a gentle heat, and boiled a little, ſo as to form a ſyrup.

THIS preparation is a plain liquid, ſweet, without flavour or colour; and is more convenient in extemporaneous preſcription than ſugar undiſſolved.

SYRUPUS ACIDI ACETOSI. *Ed.*
Syrup of Acetous Acid.

Take of
Acetous acid, two pounds and a half;
Double refined ſugar, three pounds and a half.
Boil them ſo as to form ſyrup.

THIS is to be conſidered as ſimple ſyrup merely acidulated, and is by no means unpleaſant. It is often employed in mucilaginous mixtures, and the like: and, on account of its cheapneſs, it is often preferred to ſyrup of lemons.

SYRUPUS ALLII. *Dub.*
Syrup of Garlic.

Take of
Garlic, ſliced, one pound;
Double refined ſugar, four pounds;
Boiling water, two pounds.
Macerate the garlic in the water in a cloſe veſſel for twelve hours, and add the ſugar to the ſtrained liquor.

This is a very difagreeable fyrup; but when we wifh to extract the virtues of garlic by a watery menftruum, it is the beft means we can employ.

SYRUPUS ALTHÆÆ OFFICINALIS. *Edin.*
Syrup of Marfhmallow.

Take of
Frefh marfhmallow roots, fliced, one pound;
Water, ten pounds;
Double refined fugar, four pounds.

Boil the water with the roots to the confumption of one half, and ftrain the liquor, with ftrong expreffion. Suffer the ftrained decoction to remain at reft till the feces have fubfided; add the fugar to the depurated decoction, and boil fo as to make a fyrup.

SYRUPUS ALTHÆÆ. *Lond.*
Syrup of Marfhmallow.

Take of
Frefh root of marfhmallow, bruifed, one pound;
Double refined fugar, four pounds;
Diftilled water, one gallon.

Boil the water with the marfhmallow root to one half, and prefs out the liquor when cold. Set it by twelve hours; and, after the feces have fubfided, pour off the liquor. Add the fugar, and boil it to the weight of fix pounds.

This is merely a mucilaginous fyrup, and is chiefly ufed in nephritic cafes, for fweetening emollient decoctions, and the like.

SYRUPUS AMOMI ZINGIBERIS. *Edin.*
Syrup of Ginger.

Take of
Beat ginger, three ounces;
Boiling water, four pounds;
Double refined fugar, feven pounds and a half.

Macerate the ginger in the water in a clofe veffel, for twenty-four hours; ftrain the infufion, and form a fyrup by adding the fugar.

SYRUPUS ZINGIBERIS. *Lond.*
Syrup of Ginger.

Take of
Ginger, bruifed, four ounces;
Boiling diftilled water three pints.

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Macerate for four hours, and ſtrain; then add double refined ſugar, and make into a ſyrup, according to the general preſcription.

These are agreeable and moderately aromatic ſyrups, impregnated with the flavour and virtues of the ginger.

Off. prep.—Elect. catechu, *Dub.* Elect. opiat. *Ed.* Pil aloes, *Lond.* Pil ſcill. *Lond. Dub.*

SYRUPUS CITRI AURANTII. *Edin.*

Syrup of Orange-Peel.

Take of

The freſh outer rind of Seville oranges, ſix ounces;
Boiling water, three pounds;
Double refined ſugar, four pounds.

Macerate the rind in the water for twelve hours; then add to the filtered liquor the ſugar, in powder, and, with a gentle heat, form a ſyrup.

Syrupus Corticis Aurantii. *Lond. Dub.*

Syrup of Orange-Peel.

Take of

Freſh outer rind of Seville oranges, eight ounces;
Boiling diſtilled water, five pints.

Macerate for twelve hours, in a cloſe veſſel; and, in the ſtrained liquor, diſſolve double refined ſugar to make a ſyrup.

In making this ſyrup, it is particularly neceſſary that the ſugar be previouſly powdered, and diſſolved in the infuſion with as gentle a heat as poſſible, to prevent the exhalation of the volatile parts of the peel. With theſe cautions, the ſyrup proves a very elegant and agreeable one, poſſeſſing a great ſhare of the fine flavour of the orange peel.

Off. prep.—Elect. aromat. *Ed. Dub.* Elect. catechu comp. *Dub.* Elect. ſcammon. *Dub.*

SYRUPUS CITRI MEDICI; olim Syrupus Limonum. *Ed.* Syrupus Limonis Succi. *Lond. Dub.*

Syrup of Lemons.

Take of

Juice of lemons, filtered after the feces have ſubſided, three parts, (two pints, *Lond.* two pounds, *Dub.*)
Double refined ſugar, five parts, (fifty ounces, *Lond.* four pounds, *Dub.*)

Diſſolve the ſugar in the juice, ſo as to make a ſyrup.

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In the ſame way are prepared,

SYRUPUS SUCCI FRUCTUS MORI.
Syrup of Mulberry-juice.

SYRUPUS SUCCI FRUCTUS RUBI IDÆI. *Lond.*
Syrup of Raſpberry-juice.

SYRUPUS SUCCI FRUCTUS RIBIS NIGRI. *Lond.*
Syrup of Black Currant-juice.

ALL theſe are very pleaſant cooling ſyrups; and with this intention they are occaſionally uſed in draughts and juleps, for quenching thirſt, abating heat, &c. in bilious or inflammatory diſtempers. They are ſometimes likewiſe employed in gargariſms for inflammations of the mouth and tonſils.

SYRUPUS COLCHICI AUTUMNALIS. *Ed.*
Syrup of Colchicum.

Take of
Colchicum root, freſh, cut into thin ſlices, one ounce;
Vinegar, ſixteen ounces;
Double refined ſugar, twenty-ſix ounces.
Macerate the root in the vinegar two days, occaſionally ſhaking the veſſel; then ſtrain the infuſion with gentle expreſſion. To the ſtrained infuſion add the ſugar, and boil a little, ſo as to form a ſyrup.

THIS ſyrup ſeems to be the beſt preparation of the colchicum. We muſt take care to gather this root in the proper ſeaſon: and from errors in this particular we are to aſcribe the uncertainty in the effects of this medicine as found in the ſhops.

It is chiefly employed as a diuretic, and may be taken from a drachm or two to the extent of an ounce, or more.

SYRUPUS DIANTHI CARYOPHYLLI. *Edin.*
Syrup of Clove July-flower.

Take of
Clove July flowers, freſh gathered and freed from the heels, one pound.
Double refined ſugar, ſeven pounds.
Boiling water, four pounds.
Macerate the petals in the water for twelve hours; and diſſolve

in the filtered infusion the ſugar in powder, by a gentle heat, ſo as to form a ſyrup.

SYRUPUS CARYOPHYLLI RUBRI. *Lond.*
Syrup of Clove July-flower.

Take of
Freſh clove July flowers, two pounds;
Boiling diſtilled water, ſix pints.
Macerate for twelve hours in a glaſs veſſel; and, in the ſtrained liquor diſſolve double refined ſugar, ſo as to form a ſyrup.

As the beauty of the colour is principally attended to in this ſyrup, no force ſhould be uſed in expreſſing the infuſion from the flowers.

Some have ſubſtituted to it one eaſily prepared at ſeaſons when the flowers are not to be procured: an ounce of ſpice-cloves is infuſed for ſome days in twelve ounces of white wine, the liquor ſtrained, and, with the addition of twenty ounces of ſugar, boiled to the proper conſiſtence of a ſyrup, to which a little cochineal gives a colour exactly ſimilar to that prepared from the clove July-flower; and its flavour is of the ſame kind, though not ſo pleaſant. The counterfeit may be readily detected by adding to a little of the ſyrup ſome alkaline ſalt or ley; which will change the genuine ſyrup to a green colour; but in the counterfeit it will make no ſuch alteration, only varying the ſhade of the red.

SYRUPUS CROCI. *Lond.*
Syrup of Saffron.

Take of
Saffron, one ounce;
Boiling diſtilled water, one pint.
Macerate the ſaffron in the water for twelve hours, in a cloſe veſſel; and diſſolve double refined ſugar in the ſtrained liquor, that it may be made a ſyrup.

SAFFRON is very well fitted for making a ſyrup, as in this form a ſufficient doſe of it is contained in a reaſonable bulk. This ſyrup is a pleaſant cordial, and gives a fine colour to juleps.

Off. prep.—Pil aloes cum myrrha, *Lond.* Pil galb. comp. *Lond.*

SYRUPUS MANNÆ. *Dub.*
Syrup of Manna.

Take of
Manna,
Double refined ſugar, each one pound
Senna, half an ounce;
Boiling water, a pound.
Macerate the ſenna in the water, in a covered veſſel, for twelve hours; then, with the ſtrained liquor mix the manna and the ſugar, ſo that they may be diſſolved.

THIS ſyrup is a mild purgative, and well adapted to children and perſons of a delicate conſtitution.

SYRUPUS PAPAVERIS SOMNIFERI. *Ed.*
Syrup of White Poppies.

Take of
White poppy-heads, dried, and freed from the ſeeds, two pounds;
Boiling water, thirty pounds;
Double refined ſugar, four pounds.
Macerate the ſliced heads in the water for twelve hours: boil the infuſion till only one third part of the liquor remain; then ſtrain the decoction with ſtrong expreſſion. Boil the ſtrained decoction to the conſumption of one half, and ſtrain again; laſtly, add the ſugar, and boil a little, ſo as to form a ſyrup.

SYRUPUS PAPAVERIS ALBI. *Lond.*
Syrup of White Poppy.

Take of
The heads of white poppies, dried, three pounds and a half;
Double refined ſugar, ſix pounds;
Diſtilled water, eight gallons.
Slice and bruiſe the heads, then boil them in the water, to three gallons, in a water bath, ſaturated with ſea-ſalt, and preſs out the decoction. Reduce this, by boiling, to about four pints, and ſtrain it while hot, through a ſieve, then through a thin woollen cloth, and ſet it aſide for twelve hours, that the feces may ſubſide. Boil the liquor, poured off from the feces, to three pints, and diſſolve the ſugar in it, that it may be made a ſyrup.

THIS ſyrup, impregnated with the narcotic matter of the poppy-heads, is given to children in doſes of two or three drachms; and to adults, of half an ounce to an ounce and upwards, for eaſing

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pain, procuring reſt, and anſwering the other intentions of mild opiates. Particular care is requiſite in its preparation, that it may be always made, as nearly as poſſible, of the ſame ſtrength; and accordingly the colleges have been very minute in their deſcription of the proceſs.

Off. prep.—Confectio opiata, *Lond.*

SYRUPUS OPII. *Dub.*

Syrup of Opium.

Take of
Extract of opium, forty-eight grains;
Boiling water, three pounds.

Macerate until the opium be diſſolved, then add double refined ſugar ſo as to make a ſyrup according to the general formula.

This ſyrup is an elegant ſubſtitute for the former. It is made with infinitely leſs trouble, and is always of an uniform ſtrength. It contains about two grains and a half of opium in the ounce.

SYRUPUS PAPAVERIS ERRATICI. *Lond.*

Syrup of Red Poppy.

Take of
The freſh flowers of the red poppy, four pounds;
Boiling diſtilled water, four pints and a half.

Put the flowers, by degrees, into the boiling water, in a water bath, conſtantly ſtirring them. After this, the veſſel being taken out of the bath, macerate for twelve hours; then preſs out the liquor, and ſet it apart, that the feces may ſubſide. Laſtly, make it into a ſyrup with double refined ſugar.

The deſign of putting the flowers into boiling water in a water bath is, that they may be a little ſcalded, ſo as to ſhrink enough to be all immerged in the water; without this precaution they can ſcarce be all got in: but they are to be continued no longer over the fire than till this effect is produced, leſt the liquor become too thick, and the ſyrup be rendered ropy.

As a medicine it is perfectly inſignificant.

SYRUPUS RHAMNI CATHARTICI. *Edin.*

Syrup of Buckthorn.

Take of
The juice of ripe buckthorn berries, depurated, two parts;
Double refined ſugar, one part.

Boil them ſo as to form a ſyrup.

Syrupus Spinæ Cervinæ. *Lond.*
Syrup of Buckthorn.

Take of
The freſh juice of ripe buckthorn berries, one gallon;
Ginger, bruiſed, one ounce;
Pimento, powdered, one ounce and a half;
Double refined ſugar, ſeven pounds.

Set aſide the juice for three days, that the feces may ſubſide; and then ſtrain it. Macerate the ginger and pimento in a pint of the ſtrained juice for four hours, and ſtrain. Boil away the reſt of the juice to three pints; then add that part of the juice in which the ginger and pimento have been macerated, and form a ſyrup of it with the ſugar.

Both theſe preparations in doſes of three or four ſpoonfuls, operate as briſk cathartics. The principal inconveniencies attending them are their being very unpleaſant, and their occaſioning a thirſt and dryneſs of the mouth and fauces, and ſometimes violent gripes; theſe effects may be prevented by drinking liberally of water-gruel, or other warm liquids, during the operation.

SYRUPUS ROSÆ GALLICÆ. *Ed.*
Syrup of Red Roſes.

Take of
The dried petals of red roſes, ſeven ounces;
Double refined ſugar, ſix pounds;
Boiling water, five pounds.

Macerate the roſes in the water for twelve hours, then boil a little and ſtrain the liquor, add to it the ſugar, and boil again for a little ſo as to form a ſyrup.

This ſyrup is ſuppoſed to be mildly aſtringent; but is principally valued on account of its red colour.

Off. prep.—Elect. catechu. *Ed.*

SYRUPUS ROSÆ CENTIFOLIÆ. *Ed.*
Syrup of Damaſk Roſes.

Take of
The freſh petals of the damaſk roſe, one pound;
Boiling water, four pounds.
Double refined ſugar, three pounds.

Macerate the roſes in the water for twelve hours; then to the infuſion ſtrained add the ſugar, and boil them into a ſyrup.

SYRUPUS ROSÆ. *Lond.*
Syrup of Roses.

Take of
The dried petals of the damask rose, seven ounces;
Double refined sugar, six pounds;
Boiling distilled water, four pints.
Macerate the roses in the water for twelve hours, and strain. Evaporate the strained liquor to two pints and a half, and add the sugar, that it may be made a syrup.

THIS syrup is an agreeable and mild purgative for children, in the dose of half a spoonful, or a spoonful. It likewise proves gently laxative to adults; and with this intention may be of service in costive habits.

Off. prep.—Elect. cassiæ, *Ed. Lond. Dub.* Elect. scammon. *Lond.*

SYRUPUS SCILLÆ MARITIMÆ. *Ed.*
Syrup of Squills.

Take of
Vinegar of squills, two pounds;
Double refined sugar in powder, three pounds and a half.
Dissolve the sugar with a gentle heat, so as to form a syrup.

THIS syrup is used chiefly in doses of a spoonful or two, for promoting expectoration, which it does very powerfully. It is also given as an emetic to children.

SYRUPUS TOLUIFERÆ BALSAMI; vulgo SYRUPUS BALSAMICUS. *Ed.*
Syrup of Balsam of Tolu, formerly *Balsamic Syrup.*

Take of
Common syrup, two pounds;
Tincture of balsam of Tolu, one ounce.
With the syrup recently prepared, and when it has almost grown cold after having been removed from the fire, gradually mix the tincture with constant agitation.

SYRUPUS TOLUTANUS. *Lond.*
Syrup of Tolu.

Take of
The balsam of Tolu, eight ounces;
Distilled water, three pints.

Boil for two hours. Mix the double refined ſugar with the liquor, ſtrained after it is cold, that it may be made a ſyrup.

THE intention of the contrivers of the two foregoing proceſſes ſeems to have been ſomewhat different. In the latter, which is certainly the moſt elegant, the benzoic acid of the balſam alone is contained; the other ſyrup contains the whole ſubſtance of the balſam in larger quantity. They are both moderately impregnated with the agreeable flavour of the balſam.

SYRUPUS VIOLÆ ODORATÆ. *Edin.*

Syrup of Violets.

Take of

Freſh violets, one pound;

Boiling water, four pounds;

Double refined ſugar, ſeven pounds and a half.

Macerate the violets in the water for twenty-four hours in a glaſs or glazed earthen veſſel, cloſe covered, then ſtrain without expreſſion, and to the ſtrained infuſion add the ſugar, powdered, ſo as to form a ſyrup.

SYRUPUS VIOLÆ. *Lond. Dub.*

Syrup of Violets.

Take of

The freſh petals of the violet, two pounds;

Boiling diſtilled water, five pints, (ſix pounds, *Dub.*)

Macerate for twenty-four hours; afterwards ſtrain the liquor, without expreſſion, through thin linen. Add double refined ſugar, that it may be made a ſyrup.

THIS ſyrup has a very agreeable flavour; and in the quantity of a ſpoonful or two proves to children gently laxative. It is apt to loſe, in keeping, the elegant blue colour, for which it is chiefly valued; and hence ſome have been induced to counterfeit it with materials whoſe colour is more permanent, and which are more eaſily obtained. This abuſe may be readily diſcovered, by adding to a little of the ſuſpected ſyrup any acid or alkaline liquor. If the ſyrup be genuine, the acid will change it red, and the alkali green; but if counterfeit, theſe changes will not happen. From this mutability of the colour of the violet, it forms an excellent teſt of the preſence of acids and alkalies; and, it is alſo obvious, that a preſcriber would be deceived, if he ſhould expect to give any blue tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue ſyrup.

CHAP. XXVII.

MEDICATED HONEYS.

MEL DESPUMATUM. *Dub.* MELLIS DESPUMATIO. *Lond.*
Clarified Honey. The Clarification of Honey.

Melt the honey in a water bath, and remove the ſcum as it riſes.

IN this ſimple proceſs, the honey is rendered ſo liquid by the heat of the boiling water, that the wax and other lighter impurities which it commonly contains, riſe to the ſurface in the form of a ſcum, which is eaſily removed. At the ſame time, ſand or any heavier mixture of that kind ſinks to the bottom.

Honey was ſuppoſed to be peculiarly balſamic, and was therefore at one time much uſed in pharmacy. But as its ſaccharine matter is abſolutely of the ſame nature with that of ſugar, and as the extraneous matters which it always contains, make it diſagree with the ſtomachs of many individuals, the number of medicated honeys has been much diminiſhed, and their place in ſome inſtances ſupplied by ſyrups. Medicated honeys are known to be of a proper conſiſtence, by allowing a ſmall quantity to cool on a plate, if when divided by the edge of a ſpoon, the portions do not immediately reunite, or if the ſpecific gravity, when hot, be 1.26, or 1.31, when cold.

MEL ACETATUM. *Lond.* OXYMEL SIMPLEX. *Dub.*
Acetated Honey. Simple Oxymel.

Take of
Clarified honey, two pounds;
Diſtilled vinegar, one pound by weight.
Boil them in a glaſs veſſel with a gentle fire to the conſiſtency of a ſyrup, (*Lond.*)
Having mixed them, bring them thrice to boil in a glaſs veſſel, and remove the ſcum each time, (*Dub.*)

THIS ſyrup is now hardly ever prepared by the apothecary,

but is a favourite and uſeful domeſtic remedy in colds and ſlight ſore throats.

OXYMEL COLCHICI. *Lond.*
Oxymel of Meadow Saffron.

Take of
The freſh root of meadow ſaffron, cut into thin ſlices, one ounce;
Diſtilled vinegar, one pint;
Clarified honey, two pounds.
Macerate the root of meadow ſaffron with the vinegar, in a glaſs veſſel, with a gentle heat, for forty-eight hours. Strain the liquor, preſſed out ſtrongly from the root, and add the honey. Laſtly, boil the mixture, frequently ſtirring it with a wooden ſpoon, to the thickneſs of a ſyrup.

This is an active preparation, but its uſe may be entirely ſuperſeded by the ſyrup of the ſame root.

MEL ROSÆ. *Lond. Dub.*
Honey of Roſes.

Take of
Dried red roſe buds, (with the heels cut off, *Dub.*) four ounces;
Boiling diſtilled water, three pints;
Clarified honey, (honey, *Dub.*) five pounds.
Macerate the roſe leaves in the water for ſix hours; then mix the honey with the ſtrained liquor, and boil the mixture to the thickneſs of a ſyrup, (removing the ſcum, *Dub.*)

This preparation is not unfrequently uſed as a mild cooling detergent, particularly in gargles for ulcerations and inflammation of the mouth and tonſils. The roſe buds here uſed ſhould be haſtily dried, that they may the better preſerve their aſtringency.

The Dublin college, in making this and other ſimilar preparations, uſed unclarified honey, with the idea, probably, that it may be equally well clarified in the courſe of the preparation itſelf. This is no doubt true, but as we do not know what effect the clarification may have on the active ſubſtances added to the honey, we think that the uſe of clarified honey, as directed by the London college, is preferable.

MEL SCILLÆ. *Lond.* MEL SCILLITICUM. *Dub.*
Honey of Squills.

Take of
Clarified honey, (honey, *Dub.*) three pounds;
Tincture of ſquills, two pints.
Boil them in a glaſs veſſel to the thickneſs of a ſyrup, (removing the ſcum, *Dub.*)

THIS is merely a ſweetened tincture of ſquills, and when wanted, may be prepared extemporaneouſly.

OXYMEL SCILLÆ. *Lond*
Oxymel of Squills.

Take of
Clarified honey, three pounds;
Vinegar of ſquills, two pints.
Boil them in a glaſs veſſel, with a ſlow fire, to the thickneſs of a ſyrup.

OXYMEL of ſquills is a uſeful aperient, detergent, and expectorant, and of great ſervice in humoral aſthmas, coughs, and other diſorders where thick phlegm abounds. It is given in doſes of two or three drachms, along with ſome aromatic water, as that of cinnamon, to prevent the great nauſea which it would otherwiſe be apt to excite. In large doſes, it proves emetic.

OXYMEL ÆRUGINIS. *Lond.*
Oxymel of Verdegris.

Take of
Prepared verdegris, one ounce;
Vinegar, ſeven ounces:
Clarified honey, fourteen ounces.
Diſſolve the verdegris in the vinegar, and ſtrain it through linen; then add the honey, and boil the whole to a proper thickneſs.

WHEN properly diluted with water, this preparation has been recommended in venereal ulcerations of the mouth and tonſils; although from the riſk of a portion of it being ſwallowed, other detergent gargles are to be preferred. Externally it is applied mixed with any digeſtive ointment, to deſtroy fungous fleſh, and to excite unhealthy ulcers.

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CHAP. XXVIII.

EMULSIONS and MIXTURES.

In this chapter we comprehend thofe mixtures in which oils, and other fubftances infoluble in water, are mixed with, and fufpended in watery fluids, by means of vifcid fubftances, fuch as mucilage and fyrups.

EMULSIO AMYGDALÆ COMMUNIS. *Edin.*
Almond Emullion.

Take of
Sweet almonds, one ounce;
Water, two pounds and a half.
Beat diligently the blanched almonds in a ftone mortar, gradually pouring on them the water; then ftrain the liquor.

Lac Amygdalæ. *Lond.* Lac Amygdalarum. *Dub.*
Almond Milk.

Take of
Sweet almonds, an ounce and a half;
Double refined fugar, half an ounce;
Diftilled water, two pints.
Beat the almonds with the fugar; then rubbing them together, add by degrees the water, and ftrain the liquor.

EMULSIO MIMOSÆ NILOTICÆ; vulgo Emulsio Arabica. *Edin.*
Arabic Emulfion.

Is made in the fame manner as the almond emulfion, only adding, while beating the almonds,
Mucilage of gum arabic, two ounces.

Emulsio Arabica. *Dub.*
Arabic Emulfion.

Take of
Gum arabic, in powder, two drachms;
Almonds, blanched, half an ounce;
Double refined fugar, three drachms;
Decoction of barley, one pound.

Diſſolve the gum in the warm decoction, and when it is almoſt cold, pour it upon the almonds, previouſly well beaten with the ſugar, and at the ſame time triturate them together, ſo as to form a kind of milk, and then filter.

ALL theſe may be conſidered as poſſeſſing nearly the ſame qualities. They are merely mechanical ſuſpenſions of oil of almonds in watery fluids, by means either of the mucilage with which it is naturally combined in the almonds by itſelf, or aſſiſted by the addition of gum arabic and ſugar. Therefore, on ſtanding for ſome days, the oily matter ſeparates and riſes to the top, not in a pure form, but like thick cream. By heat the ſame decompoſition is immediately effected.

Great care ſhould be taken that the almonds have not become rancid by keeping, which not only renders the emulſion extremely unpleaſant, a circumſtance of great conſequence in a medicine that requires to be taken in large quantities, but likewiſe gives it injurious qualities.

The almonds are blanched by infuſing them in boiling water, and peeling them. The ſucceſs of the preparation depends upon beating the almonds to a ſmooth pulp, and triturating them with each portion of the watery fluid, ſo as to form an uniform mixture before another portion be added.

Theſe liquors are principally uſed for diluting and correcting acrimonious humours; particularly in heat of urine and ſtranguaries, ariſing either from a natural acrimony of the juices, or from the operation of cantharides, and other irritating medicines; in theſe caſes, they are to be drunk frequently, to the quantity of half a pint or more at a time.

EMULSIO CAMPHORATA. *Edin.*
Camphorated Emulſion.

Take of
- Camphor, one ſcruple;
- Sweet almonds, blanched, two drachms;
- Double refined ſugar, one drachm;
- Water, ſix ounces.

THIS is made in the ſame manner as the common almond emulſion.

MISTURA CAMPHORATA. *Lond.*
Camphorated Mixture.

Take of
- Camphor, one drachm;

Rectified ſpirit of wine, a little;
Double refined ſugar, half an ounce;
Boiling diſtilled water, one pint.

Rub the camphor firſt with the ſpirit of wine, then with the ſugar; laſtly, add the water by degrees, and ſtrain the mixture.

NEITHER of theſe mixtures are very permanent, as the camphor ſeparates and ſwims upon the ſurface in the courſe of a few days. As extemporaneous preſcriptions, they are, however, very convenient modes of exhibiting that active drug, and may be given to the extent of a table ſpoonful every three or four hours in typhoid fevers. In the preceding edition of the London Pharmacopœia, ten drops of ſpirit were ordered inſtead of the preſent indeterminate quantity.

LAC AMMONIACI. *Lond. Dub.*
Emulſion of Gum Ammoniac.

Take of
Gum ammoniac, two drachms;
Diſtilled water, half a pint, (eight ounces, *Dub.*)

Rub the gum reſin with the water, gradually poured on, until it becomes an emulſion.

LAC ASSÆ FOETIDÆ. *Lond.*
Emulſion of Aſſa Fœtida

In the ſame manner may be made an emulſion of aſſa fœtida, and the reſt of the gum reſins.

THE lac ammoniaci is employed for attenuating tough phlegm, and promoting expectoration in humoral aſthmas, coughs, and obſtructions of the viſcera. It may be given to the quantity of two ſpoonfuls twice a-day.

It anſwers the ſame purpoſes as aſſa fœtida in ſubſtance, and on ſome occaſions is a more convenient, though very diſagreeable, mode of exhibiting it.

MISTURA MOSCHATA. *Lond.*
Muſk Mixture.

Take of
Muſk, two ſcruples;
Gum arabic, powdered,
Double refined ſugar, of each one drachm;
Roſe water, ſix ounces, by meaſure.

Rub the muſk firſt with the ſugar, then with the gum, and add the roſe water by degrees.

Unless the muſk be very thoroughly triturated with the ſugar and gum before the addition of the water it ſoon ſeparates. An ounce, or an ounce and a half, may be taken for a doſe.

POTIO CARBONATIS CALCIS; olim Potio Cretacea. *Ed.*

Chalk Potion.

Take of
Prepared carbonate of lime, one ounce;
Double refined ſugar, half an ounce;
Mucilage of gum arabic, two ounces.
Triturate together, and then gradually add of
Water, two pounds and a half;
Spirit of cinnamon, two ounces.
Mix them.

Mistura Cretacea. *Lond. Dub.*

Chalk Mixture.

Take of
Prepared chalk, one ounce, (half an ounce, *Dub.*);
Double refined ſugar, ſix drachms, (three drachms, *Dub.*);
Gum arabic, powdered, one ounce;
Diſtilled water, two pints, (fifteen ounces, *Dub.*)
Mix them.

This is a very elegant form of exhibiting chalk, and is an uſeful remedy in diſeaſes ariſing from or accompanied with acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cauſe. The mucilage not only ſerves to keep the chalk uniformly diffuſed, but alſo improves its virtues. Of this medicine a pound or two may be taken in the courſe of a day.

DECOCTUM CORNU CERVI. *Lond.*

Decoction of Hartſhorn.

Take of
Burnt and prepared hartſhorn, two ounces;
Gum arabic, ſix drachms;
Diſtilled water, three pints.
Boil, conſtantly ſtirring, to two pints; and ſtrain.

Prepared hartſhorn is phoſphate of lime in a minute ſtate of mechanical diviſion. By boiling in a mucilaginous liquid, it will be diffuſed and imperfectly ſuſpended, but not a particle of it will be diſſolved. This is therefore an extremely injudicious preparation; for phoſphate of lime would be much more eaſily and effectually ſuſpended by triturating it with a larger proportion of gum arabic, and adding the water gradually. But we believe that this preparation has no other action than that of a weak mucilage.

CHAP. XXIX.

MEDICATED VINEGARS.

Infusions of vegetable ſubſtances in acetic acid are commonly called Medicated Vinegars. The action of the acid in this caſe may be conſidered as twofold.

1. It acts ſimply as water, in conſequence of the great quantity of water which enters into its compoſition, and generally extracts every thing which water is capable of extracting.

2. It exerts its own peculiar action as an acid. In conſequence of this, it ſometimes increaſes the ſolvent power of its watery portion, or diſſolves ſubſtances which water alone is incapable of diſſolving, and in a few inſtances it impedes the ſolution of ſubſtances which water alone would diſſolve.

As acetic acid, in itſelf ſufficiently periſhable, has its tendency to decompoſition commonly increaſed by the ſolution of any vegetable matter in it, it ſhould never be uſed as a menſtruum, unleſs where it promotes the ſolution of the ſolvend, as in extracting the acrid principle of ſquills, colchicum, &c. and in diſſolving the volatile, and eſpecially the empyreumatic, oils, or where it coincides with the virtues of the ſolvend.

ACETUM AROMATICUM. *Ed.*
Aromatic Vinegar.

Take of
Rosemary tops, dried,
Sage leaves, dried, each four ounces;
Lavender flowers, dried, two ounces;
Cloves, two drachms;
Distilled acetous acid, eight pounds.
Macerate for seven days, express the liquor, and strain it through paper.

This is given as an improved preparation of the *Vinaigre des quatre voleurs*, which was supposed to be a certain prophylactic against the contagion of plague and similar diseases. It is in fact a pleasant solution of essential oils in vinegar, which will have more effect in correcting bad smells, than in preventing fever.

ACETUM COLCHICI. *Dub.*
Vinegar of Meadow Saffron.

Take of
The recent root of colchicum, cut in slices, one ounce;
Vinegar, one pound;
Diluted spirit of wine, one ounce and a half.
Macerate the root in the vinegar for four days, in a glass vessel, frequently agitating them; then express the acid, to which, decanted from the feces, after they have subsided, add the spirit.

The acrid principle in which the virtue of the colchicum resides, is more soluble in vinegar than in water: this is therefore a preparation of considerable activity. The diluted alcohol is added merely to prevent it from spoiling.

ACETUM SCILLÆ MARITIMÆ. *Ed.*
Vinegar of Squills.

Take of
Dried squills, two ounces;
Distilled acetous acid, two pounds and a half;
Alcohol, three ounces.
Macerate the squills in the acetous acid for seven days; then press out the liquor, to which add the alcohol; and when the feces have subsided, pour off the clear liquor.

Acetum Scillæ. *Lond.*
Vinegar of Squills.

Take of
Squills, recently dried, one pound;
Vinegar, ſix pints;
Proof ſpirit, half a pint.

Macerate the ſquills with the vinegar in a glaſs veſſel, with a gentle heat for twenty-four hours; then expreſs the liquor, and ſet it aſide until the feces ſubſide. To the decanted liquor add the ſpirit.

Acetum Scilliticum. *Dub.*
Squill Vinegar.

Take of
Squills, recently dried, half a pound;
Vinegar, three pounds;
Proof ſpirit, four ounces.

Macerate the ſquills in the vinegar for four days in a glaſs veſſel, frequently agitating it; then expreſs the acid; to which, poured from the feces after they have ſubſided, add the ſpirit.

Vinegar of ſquills is a medicine of great antiquity. It is a very powerful ſtimulant; and hence it is frequently uſed, with great ſucceſs, as a diuretic and expectorant. The doſe of this medicine is from a drachm to half an ounce: where crudities abound in the firſt paſſages, it may be given at firſt in a larger doſe, to evacuate them by vomiting. It is moſt conveniently exhibited along with cinnamon, or other agreeable aromatic waters, which prevent the nauſea it would otherwiſe, even in ſmall doſes, be apt to occaſion.

Off. prep.—Syr. ſcillæ, *Ed.*

ACIDUM ACETOSUM CAMPHORATUM. *Ed.*
Camphorated Acetous Acid.

Take of
The ſtronger acetous acid, ſix ounces;
Camphor, half an ounce.

Reduce the camphor to powder, by triturating it with a little alcohol; then diſſolve it in the acid.

The alcohol in this preparation is uſed merely to facilitate the reduction of the camphor to powder; for the ſtrong acetous, or, as we would rather call it, the acetic acid, is capable of diſſolving

even a larger proportion of camphor than is directed in the above formula.

This solution is a powerful analeptic remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals except gold. It should therefore be kept in glass phials, with ground glass stoppers, or in small gold boxes, such as are used for Henry's aromatic spirit of vinegar, for which it is in fact a simpler substitute.

CHAP. XXX.

TINCTURES.

THE term Tincture has often been employed in a very vague sense. It is now commonly applied to solutions, made by digestion, in alcohol, or diluted alcohol. But it is also, though perhaps incorrectly, extended to solutions in ether, ethereal spirits, and spirit of ammonia.

Alcohol is capable of dissolving resins, gum resins, extractive tannin, sugar, volatile oils, soaps, camphor, adipocere, colouring matters, acids, alkalies, and some compound salts. Many of these, as the gum resins, soaps, extractive, tannin, sugar, and saline substances, are also soluble in water, while water is capable of dissolving substances, such as gum, gelatin, and most of the compound salts, which are insoluble in alcohol. But the insolubility of these substances in the different menstrua is not absolute, but merely relative; for a certain proportion of alcohol may be added to a solution of gum in water without decomposing it; and a solution of resin in alcohol will bear a certain admixture of water without becoming turbid. Therefore, diluted alcohol, which is a mixture of these two menstrua, sometimes extracts the virtues of heterogenous compounds more completely than either of them separately.

Alcohol is used as a menstruum.

1. When the ſolvend is not ſoluble, or ſparingly ſoluble, in water.
2. When a watery ſolution of the ſolvend is extremely periſhable.
3. When the uſe of alcohol is indicated as well as that of the ſolvend.

In making alcoholic tinctures, we muſt obſerve that the virtues of recent vegetable matters are very imperfectly extracted by ſpirituous menſtrua. They muſt therefore be previouſly carefully dried, and as we cannot aſſiſt the ſolution by means of heat, we muſt facilitate it by reducing the ſolvend to a ſtate of as minute mechanical diviſion as poſſible. To prevent loſs, the ſolution is commonly made in a cloſe veſſel, and the heat applied muſt be very gentle, leſt it be broken by the expanſion of vapour.

The action of tinctures on the living ſyſtem is always compounded of the action of the menſtruum, and of the matters diſſolved in it. Now, theſe actions may either coincide with, or oppoſe, each other; and as alcohol is at all times a powerful agent, it is evident that no ſubſtance ſhould be exhibited in the form of a tincture, whoſe action is different from that of alcohol, unleſs it be capable of operating in ſo ſmall a doſe, that the quantity of alcohol taken along with it is inconſiderable.

Tinctures are not liable to ſpoil, as it is called, but they muſt nevertheleſs be kept in well cloſed phials, eſpecially when they contain active ingredients, to prevent the evaporation of the menſtruum.

They generally operate in doſes ſo ſmall, that they are rarely exhibited by themſelves, but commonly combined with ſome vehicle. In chooſing the latter, we muſt ſelect ſome ſubſtance which does not decompoſe the tincture, or at leaſt ſeparate nothing from it in a palpable form.

The London college direct all tinctures, except that of muriate of iron, to be prepared in cloſed phials.

The Dublin college explain, that, when they order ſubſtances to be *digeſted*, they mean it to be done with a low degree of heat; and when they are to be *macerated*, it is to be done with a degree of heat between 60° and 90°.

TINCTURA ALOES SOCOTORINÆ. *Ed.* TINCTURA ALOES. *Dub.*

Tincture of Socotorine Aloes.

Take of

Socotorine aloes, in powder, half an ounce;

Extract of liquorice, an ounce and a half;
Alcohol, four ounces;
Water, one pound.

Digeft for feven days in a clofed veffel, with a gentle heat, and frequent agitation. (Thefe directions are to be obferved in preparing all tinctures, *Ed.*) and pour of the depurated tincture.

TINCTURA ALOES. *Lond.*
Tincture of Aloes.

Take of
Socotorine aloes, powdered, half an ounce;
Extract of liquorice, an ounce and a half;
Diftilled water,
Proof fpirit, of each eight ounces by meafure.

Digeft in a fand bath, now and then fhaking the veffel, until the extract be diffolved, and then ftrain.

THE Dublin college ufe the fame proportions with the Edinburgh college, but in double quantity; and they direct the extract of liquorice to be foftened in the water made boiling hot, which facilitates its folution. The London college order the fluids by meafure; and fixteen by meafure are only equal to fourteen ounces and a half by weight.

This is one of the fimpleft of the aloetic tinctures, and is one of the beft formulæ for the exhibition of that ufeful drug in a fluid form The liquorice is added to cover the tafte of the aloes, and to affift in fufpending them in the fluid. About an ounce may be taken for a dofe.

TINCTURA ALOESET MYRRHÆ. *Ed.*
Tincture of Aloes with Myrrh.

Take of
Myrrh, in powder, two ounces;
Alcohol, one pound and a half;
Water, half a pound.

Mix the alcohol with the water, then add the myrrh; digeft for four days; and, laftly, add
Socotorine aloes, in powder, one ounce and a half;
Saffron, cut in pieces, an ounce.

Digeft again for three days, and pour off the tincture from the fediment.

TINCTURA ALOES COMPOSITA. *Lond.*
Compound Tincture of Aloes.

Take of
 Socotorine aloes,
 Saffron, of each three ounces;
 Tincture of myrrh, two pints;
Digeſt for eight days, and ſtrain.

THIS is ſuppoſed to be an improvement on the elixir proprietatis of Paracelſus. Theſe tinctures differ conſiderably in ſtrength; the latter contains one part of aloes to eight of the menſtruum; the former one to ſixteen, while the ſimple tincture already mentioned contains but one to thirty-two. In preſcription theſe proportions muſt be attended to. The myrrh and ſaffron may add to its ſtimulating properties.

TINCTURA AMOMI REPENTIS. *Ed.*
Tincture of Cardamom.

Take of
 Leſſer cardamom ſeeds, bruiſed, four ounces;
 Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and filter through paper.

TINCTURA CARDAMOMI. *Lond. Dub.*
Tincture of Cardamom.

Take of
 Leſſer cardamom ſeeds, huſked and bruiſed, three ounces;
 Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for eight days, (ſeven, *Dub.*) and ſtrain.

TINCTURE of cardamoms has been in uſe for a conſiderable time. It is a pleaſant warm cordial; and may be taken, along with any proper vehicle, in doſes of from a drachm to a ſpoonful or two.

TINCTURA CARDAMOMI COMPOSITA. *Lond. Dub.*
Compound Tincture of Cardamom.

Take of
 Leſſer cardamom ſeeds, huſked,
 (Cochineal, *Lond.*)
 Caraway ſeeds, each, powdered, two drachms;
 Cinnamon, bruiſed, half an ounce;
 Raiſins, ſtoned, four ounces;
 Proof ſpirit, two pints, (two pounds, *Dub.*)]
Digeſt for fourteen days, and ſtrain.

This tincture is ſomewhat leſs ſtimulant than the compound tincture of cinnamon, which, beſides a larger proportion of aromatics, contains alſo long pepper. Altogether, although it may be ſufficiently pleaſant, the compoſition is injudicious; for the large proportion of raiſins uſed forms only a very uneconomical and inelegant method of ſweetening an aromatic tincture.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Ed.*

Tincture of Snake-root.

Take of

Virginian ſnake-root, bruiſed, two ounces;
Cochineal, in powder, one drachm;
Diluted alcohol, two pounds and a half.

Digeſt for ſeven days, and ſtrain through paper.

TINCTURA SERPENTARIÆ. *Lond. Dub.*

Tincture of Snake-root.

Take of

Virginian ſnake-root, three ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)

Digeſt for eight days, (ſeven, *Dub.*) and ſtrain.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a ſpoonful or more every five or ſix hours; and to this extent it often operates as an uſeful diaphoretic.

TINCTURA AURANTII CORTICIS. *Lond. Dub.*

Tincture of Orange-Peel.

Take of

Freſh orange-peel, three ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)

Digeſt for three days, and ſtrain.

This tincture is an agreeable bitter, flavoured at the ſame time with the eſſential oil of the orange-peel.

TINCTURA BALSAMI PERUVIANI. *Lond.*

Tincture of Balſam of Peru.

Take of

Balſam of Peru, four ounces;
Rectified ſpirit of wine, one pint.

Digeſt until the balſam be diſſolved.

The Balſam of Peru is totally ſoluble in alcohol, and is therefore well fitted for being exhibited in the form of a tincture; but it is now very rarely employed.

TINCTURA BENZOIN COMPOSITA; vulgo BALSAMUM TRAUMATICUM. *Lond. Ed.*
Compound Tincture of Benzoin.

Take of
Benzoin, in powder, three ounces;
(Storax, ſtrained, two ounces, *Lond.*)
Balſam of Tolu, one ounce;
Socotorine aloes, in powder, half an ounce;
Alcohol, two pounds.
Digeſt with a gentle heat for three days, (ſeven, *Ed.*) and ſtrain.

The Edinburgh college omit the ſtorax, and uſe hepatic aloes in place of the ſocotorine. Theſe differences are not very material; and both preparations may be conſidered as elegant ſimplifications of ſome very complicated compoſitions, which were celebrated under different names; ſuch as Baume de Commandeur, Wade's balſam, Friars balſam, Jeſuits drops, &c. Theſe, in general, conſiſted of a confuſed farrago of diſcordant ſubſtances.

TINCTURA CAMPHORÆ; vulgo SPIRITUS VINOSUS CAMPHORATUS. *Edin.* SPIRITUS CAMPHORATUS. *Lond. Dub.*
Tincture of Camphor. Camphorated Spirit.

Take of
Camphor, one ounce. *Ed.* four ounces, *Lond.* half an ounce, *Dub.*
Alcohol, one pound, *Ed.* two pints, *Lond.* eight ounces, *Dub.*
Mix them together, that the camphor may be diſſolved.
(It may alſo be made with a double, triple, &c. proportion of camphor, *Ed.*)

These ſolutions of camphor are only employed for external uſes, againſt rheumatic pains, paralytic numbneſſes, inflammations, for diſcuſſing tumours, preventing gangrenes, or reſtraining their progreſs. They are too pungent to be exhibited internally, and cannot be diluted with water, without being totally decompoſed.

Off. prep.—Aqua zinci vit. cum camph. *Lond.*

TINCTURA CASCARILLÆ. *Lond. Dub.*
Tincture of Cascarilla.

Take of
The bark of cascarilla, powdered, four ounces;
Proof spirit, two pints, (two pounds, *Dub.*)
Digest with a gentle heat for eight days, (seven, *Dub.*) and strain.

THE proportion of alcohol is here so large, as indeed it is in most of the tinctures of this kind, that it is merely to be considered as a concealed dram.

TINCTURA CASTOREI. *Lond. Dub.*
Tincture of Castor.

Take of
Russian castor, powdered, two ounces;
Proof spirit, two pints, (two pounds, *Dub.*)
Digest for ten days, (seven, *Dub.*) and strain.

Edin.

Take of
Russian castor, an ounce and a half;
Alcohol, one pound.
Digest them for seven days, and strain through paper.

IT has been disputed whether a weak or rectified spirit, and whether cold or warm digestion, are preferable for making this tincture.

From several experiments made to determine this question, it appears that castor, macerated without heat, gives out its finer and most grateful parts to either spirit, but most perfectly to the rectified: that heat enables both menstrua to extract the greatest part of its grosser and more nauseous matter: and that proof spirit extracts this last more readily than rectified.

The tincture of castor is recommended in most kinds of nervous complaints and hysteric disorders: in the latter, it sometimes does service, though many have complained of its proving ineffectual. The dose is from twenty drops to forty, fifty, or more.

Off. prep.—Tinct. sabinæ comp. *Lond.*

TINCTURA CINCHONÆ OFFICINALIS. *Ed.* TINCTURA CORTICIS PERUVIANI. *Dub. Lond.*
Tincture of Cinchona, or Peruvian Bark.

Take of
Cinchona bark, in powder, four ounces, (six ounces, *Lond.*)

Diluted alcohol, two pounds and a half, (two pounds, *Dub.* two pints, *Lond.*)
Digeſt for ſeven days, (eight days, *Lond.*) and ſtrain through paper, *Ed.*)

THIS tincture is certainly impregnated with the virtues of cinchona, but not to ſuch a degree that it can be given in ſufficient doſes to act as cinchona, without exhibiting more alcohol than what is proper to be given as a medicine. Indeed, we are afraid that this and other bitter and tonic tinctures, as they are called, are with ſome only an apology for dram drinking, and that the moſt apparent effects they produce are thoſe of a ſlight degree of intoxication.

TINCTURA CINCHONÆ, SIVE CORTICIS PERUVIANI COMPOSITA. *Lond. Dub.*

Compound Tincture of Peruvian Bark.

Take of
Peruvian bark, powdered, two ounces;
Exterior peel of Seville oranges, dried, one ounce and a half, (half an ounce, *Dub.*)
Virginian ſnake root, bruiſed, three drachms;
Saffron, one drachm;
(Cochineal, powdered, two ſcruples, *Lond.*)
Proof ſpirit, twenty ounces, (two pounds, *Dub.*)
Digeſt for fourteen days, and ſtrain.

THIS is ſaid to be the ſame with the celebrated *Huxham's Tincture of Bark.*

As a corroborant and ſtomachic, it is given in doſes of two or three drachms: but when employed for the cure of intermittents, it muſt be taken to a greater extent.

TINCTURA CINNAMONI COMPOSITA; olim TINCTURA AROMATICA. *Ed.*

Compound Tincture of Cinnamon, formerly *Aromatic Tincture.*

Take of
Cinnamon, bruiſed,
Leſſer cardamom ſeeds, bruiſed, each one ounce;
Long pepper, in powder, two drachms;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and filter through paper.

TINCTURA CINNAMOMI COMPOSITA. *Lond.* TINCTURA AROMATICA. *Dub.*
Aromatic Tincture.

Take of
Cinnamon, bruifed, fix drachms ;
Leffer cardamom feeds, without the capfules, one drachm, (three drachms, *Lond.*)
Long pepper, in powder,
Ginger, in powder, two drachms ;
Proof fpirit, two pounds, (two pints, *Lond.*)
Mix and digeft for feven days, then ftrain.

IN their formula, the Dublin and London colleges diminifh the quantity of cardamom feeds, and fubftitute for it a proportion of ginger. This makes no alteration on the virtues of the preparation, which is a very warm aromatic, too hot to be given without dilution. A tea fpoonful or two may be taken in wine, or any other convenient vehicle, in languors, weaknefs of the ftomach, flatulencies, and other fimilar complaints; and in thefe cafes it is often employed with advantage.

O. prep.—Æther fulph. cum alcohole aromat.

TINCTURA COLOMBÆ. *Lond Ed. Dub.*
Tincture of Colomba.

Colomba root, powdered, two ounces and a half, (two ounces, *Ed. Dub.*
Proof fpirit of wine, two pints.
Digeft for eight days, (feven, *Ed. Dub.*) and filter through paper.

THIS is a very good ftomachic tincture, which may be ufed when the ftomach will not bear the colomba in powder.

TINCTURA CONVOLVULI JALAPÆ. *Ed.* TINCTURA JALAPÆ. *Lond. Dub.*
Tincture of Jalap.

Take of
Jalap, in powder, three ounces, (eight ounces, *Lond. Dub.*)
Diluted alcohol, fifteen ounces, (two pints, *Lond.* two pounds, *Dub.*
Digeft them for feven days, (eight days, *Lond. Dub.*) and ftrain the tincture through paper.

ALCOHOL was formerly ordered for the preparation of this tinc-

ture ; but diluted alcohol is a preferable menſtruum, as it diſſolves the active conſtituents of the jalap as well as pure alcohol, and is leſs ſtimulating.

TINCTURA CROCI ANGLICI. *Ed.*

Tincture of Saffron.

Take of

English ſaffron, cut in ſhreds, one ounce ;
Diluted alcohol, fifteen ounces.

Digeſt for ſeven days, and ſtrain through paper.

The proof ſpirit is a very proper menſtruum for extracting the medical virtues of the ſaffron, and affords a convenient mode of exhibiting that drug.

TINCTURA DIGITALIS PURPUREÆ. *Ed.*

Tincture of Foxglove.

Take of

The dried leaves of foxglove, one ounce ;
Diluted alcohol, eight ounces.

Digeſt for ſeven days, and ſtrain through paper.

This tincture is a very powerful medicine, and contains the virtues of the foxglove in a very manageable form. It has been chiefly uſed to diminiſh the force of the circulation of the blood in hæmoptyſis, and often with remarkable ſucceſs. It has been alſo ſaid to cure phthiſis pulmonalis, but ſubſequent experience has not confirmed the firſt trials. Like every other form in which foxglove is given, it ſhould be given in very ſmall doſes, at firſt, ſuch as from ten to twenty drops, and cautiouſly increaſed.

TINTURA FERULÆ ASSÆ FOETIDÆ. *Ed.* TINCTURA ASSÆ FOETIDÆ. *Dub. Lond.*

Tincture of Aſſa fœtida.

Take of

Aſſa fœtida, four ounces ;
Alcohol, two pounds and a half, *Ed.* (Two pints, *Lond.*)

Digeſt for ſeven days, (ſix days, *Lond.*) and ſtrain through paper.

Dub.

Take of

Aſſa fœtida, four ounces ;
Rectified ſpirit of wine, two pounds ;
Water, eight ounces.

Add the ſpirit to the aſſa fœtida, triturated with the water, and digeſt for eight days; then ſtrain.

THIS tincture poſſeſſes the virtues of the aſſa fœtida itſelf; and may be given in doſes of from ten drops to fifty or ſixty.

TINTURA GALBANI. *Lond.*
Tincture of Galbanum.

Take of
Galbanum, cut into ſmall pieces, two ounces;
Proof ſpirit of wine, two pints.
Digeſt with a gentle heat for eight days, and ſtrain.

THIS tincture, though not ſo powerful, is leſs nauſeous than that of aſſa fœtida, and therefore in ſome caſes may be preferable.

TINCTURA GENTIANÆ COMPOSITA; vulgo ELIXIR STOMACHICUM. *Ed.*
Compound Tincture of Gentian, commonly called *Stomachic Elixir*.

Take of
Gentian root, ſliced and bruiſed, two ounces;
Seville orange-peel, dried and bruiſed, one ounce;
Canella alba, bruiſed, half an ounce;
Cochineal, in powder, half a drachm;
Diluted alcohol, two pounds and a half.
Macerate for ſeven days, and ſtrain through paper.

Lond.

Take of
Gentian root, ſliced and bruiſed, two ounces;
Exterior dried peel of Seville oranges, one ounce;
Leſſer cardamom ſeeds, huſked and bruiſed, half an ounce;
Proof ſpirit of wine, two pints.
Digeſt for eight days, and ſtrain.

THESE are very elegant ſpirituous bitters. As the preparations are deſigned for keeping, lemon peel, an excellent ingredient in the watery bitter infuſions, has, on account of the periſhableneſs of its flavour, no place in theſe. The aromatics are here very commodious ingredients, as in this ſpiritous menſtruum they are free from the inconvenience with which they are attended in other liquors, of diminiſhing their tranſparency.

TINCTURA GUAIACI OFFICINALIS. *Ed.*

Tincture of Guaiac.

Take of
Gum guaiac, in powder, one pound;
Alcohol, two pounds and a half.
Digeſt for ten days, and ſtrain through paper.

WHAT is called gum guaiac is in fact a reſin, and perfectly ſoluble in alcohol. This ſolution is a powerful ſtimulating ſudorific, and may be given in doſes of about half an ounce in rheumatic and arthritic caſes. It was once ſuppoſed to be a ſpecific againſt the gout.

TINCTURA HELLEBORI NIGRI. *Lond. Dub.*

Tincture of Black Hellebore.

Take of
Black hellebore, in coarſe powder, four ounces;
(Cochineal, powdered, two ſcruples, *Lond.*)
Proof ſpirit of wine, two pints, (two pounds, *Dub.*)
Digeſt with a gentle heat for eight days, (ſeven, *Dub.*) and ſtrain.

Edin.

Take of
Black hellebore root, bruiſed, four ounces;
Cochineal, in powder, half a drachm;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and filter through paper.

THIS is perhaps the beſt preparation of hellebore, when deſigned for an alterative, the menſtruum here employed extracting the whole of its virtues. It has been found, from experience, particularly ſerviceable in uterine obſtructions. In ſanguine conſtitutions, where chalybeates are hurtful, it has been ſaid that it ſeldom fails of exciting the menſtrual evacuations, and removing the ill conſequences of their ſuppreſſion. A tea ſpoonful of the tincture may be taken twice a-day in warm water or any other convenient vehicle.

TINCTURA HYOSCIAMI NIGRI. *Ed.*

Tincture of Henbane.

Take of
The leaves of henbane, dried, one ounce;
Diluted alcohol, eight ounces.
Digeſt for ſeven days, and ſtrain through paper.

THIS tincture, although not yet come into general uſe, is a valuable anodyne, and in many caſes may be ſubſtituted with advantage for the tincture of opium, eſpecially where the latter produces obſtinate conſtipation, or, inſtead of its uſual ſoporific and ſedative effects, it cauſes uneaſineſs, reſtleſſneſs, and univerſal irritation.

TINCTURA KINO. *Edin. Dub.*
Tincture of Kino.

Take of
Kino, in powder, two ounces;
Diluted alcohol, a pound and a half.
Digeſt for ſeven days, and ſtrain through paper.

We have already ſtated our reaſons for believing kino to be a ſpecies of tannin. This is certainly a very aſtringent tincture, and will be found an excellent medicine in obſtinate diarrhœas and in lienteria.

TINCTURA LAURI CINNAMOMI. *Ed.*
Tincture of Cinnamon.

Take of
Cinnamon, bruiſed, three ounces;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA CINNAMOMI. *Lond. Dub.*
Tincture of Cinnamon.

Take of
Cinnamon, bruiſed, one ounce and a half, (three ounces and a half, *Dub.*)
Proof ſpirit of wine, one pint, (two pints, *Dub.*)
Digeſt for ten days, and ſtrain.

THE tincture of cinnamon poſſeſſes the aſtringent virtues of the cinnamon, as well as its aromatic cordial ones; and in this reſpect it differs from the diſtilled waters of that ſpice.

TINCTURA LAVENDULÆ COMPOSITA. *Dub.* SPIRITUS LAVENDULÆ SPICÆ COMPOSITUS. *Edin.*
Compound Tincture, or Spirit, of Lavender.

Take of
Spirit of lavender, three pounds;
Spirit of roſemary, one pound;
Cinnamon, bruiſed, one ounce, (half an ounce, *Dub.*)

Cloves, bruiſed, two drachms;
Nutmeg, bruiſed, half an ounce;
Red ſaunders wood, in ſhavings, three drachms;
Macerate for ſeven days, and filter.

SPIRITUS LAVENDULÆ COMPOSITA. *Lond.*
Compound Spirit of Lavender.

Take of
Spirit of lavender, three pints;
Spirit of roſemary, one pint;
Cinnamon, bruiſed,
Nutmegs, bruiſed, of each half an ounce;
Red ſaunders, one ounce.
Digeſt for ten days, and ſtrain.

THESE preparations do not differ materially. They are grateful cordials, of which from ten to a hundred drops may be conveniently taken dropt upon ſugar. It does not appear very clearly whether they ſhould be conſidered as ſpirits or tinctures; for although the ſpirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the ſpirit as a menſtruum diſſolves aſtringent, colouring, and other ſubſtances, which would not riſe with it in diſtillation.

TINCTURA MELOES VESICATORII. *Ed.* TINCTURA CANTHARIDUM. *Dub.*
Tincture of Cantharides.

Take of
Cantharides, bruiſed, one drachm, (two drachms, *Dub.*)
Diluted alcohol, one pound, (two pounds, *Dub.*)
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA CANTHARIDIS. *Lond.*
Tincture of Spaniſh Flies.

Take of
Bruiſed cantharides, two drachms;
Cochineal, powdered, half a drachm;
Proof ſpirit, one pint and a half.
Digeſt for eight days, and ſtrain.

THIS tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a ſtimulant and rubefacient, and is ſometimes given internally in doſes of from ten to twenty drops, as a diuretic, or as a ſtimulant in gleets and gonorrhœa.

TINCTURA MIMOSÆ CATECHU; olim TINCTURA JAPONICA. *Ed.* TINCTURA CATECHU. *Lond.*

Tincture of Catechu.

Take of
Extract of catechu, three ounces;
Cinnamon, bruiſed, two ounces
Diluted alcohol, two pounds and a half, (two pints, *Lond.*)
Digeſt for ſeven days, (ten days, *Lond.*) and ſtrain through paper.

THE cinnamon is a very uſeful addition to the catechu, not only as it warms the ſtomach, but likewiſe as it covers its roughs and aſtringency.

This tincture is of ſervice in all kinds of defluxions, catarrhs, looſeneſſes, uterine fluxes, and other diſorders, where aſtringent medicines are indicated. Two or three tea ſpoonfuls may be taken every now and then in red wine, or any other proper vehicle.

TINCTURA MOSCHI. *Dub.*

Tincture of Muſk.

Take of
Muſk, two drachms;
Rectified ſpirit of wine, one pound.
Mix and macerate for ſeven days, and ſtrain.

RECTIFIED ſpirit is the moſt complete menſtruum for muſk; but in this form it is often impoſſible to give a ſufficient quantity of the muſk.

TINCTURA MYRRHÆ. *Ed. Lond. Dub.*

Tincture of Myrrh.

Take of
Myrrh, in powder, three ounces.
Alcohol, twenty ounces, (half a pint, *Lond.* two pounds, *Dub.*)
Proof ſpirit of wine, a pint and a half, *Lond.*
Water, ten ounces, *Ed.*
Digeſt for ſeven days, (eight days, *Lond.*) and ſtrain through paper.

TINCTURE of myrrh is recommended internally as a cardiac, for removing obſtructions, particularly thoſe of the uterine veſſels and reſiſting putrefaction. The doſe is from fifteen drops to forty or more. The medicine may perhaps be given in theſe caſes to advantage; though with us, it is more commonly uſed

externally, for cleanfing foul ulcers, and promoting the exfoliation of carious bones.

Off. prep.—Tinct. fabinæ. comp. *Lond.* Trochifci glycyr. cum opio, *Dub.*

TINCTURA OPII, SIVE THEBAICA; vulgo LAUDANUM LIQUIDUM. *Ed. Dub.*

Tincture of Opium, or *Thebaic Tincture*, commonly called *Liquid Laudanum.*

Take of
Opium, two ounces;
Diluted alcohol, two pounds.
Digeft for feven days, and filter through paper.

Lond.

Take of
Hard purified opium, powdered, ten drachms;
Proof fpirit of wine, one pint.
Digeft for ten days, and ftrain.

As thefe tinctures on evaporation furnifh the fame quantity of extract, they are believed to be of nearly equal ftrength, but it is to be regretted that they are not fo well adapted for keeping as could be wifhed: after fome time, a part of the opium is gradually depofited from both, and confequently the tinctures become weaker: the part which thus feparates, amounts fometimes, as it is faid to near one fourth of the quantity of opium at firft diffolved.

TINCTURA OPII CAMPHORATA. *Lond.* olim ELIXIR PAREGORICUM. *Dub.*

Camphorated Tincture of Opium. Paregoric Elixir.

Take of
Hard purified opium,
Flowers of benzoin, of each, one drachm;
Camphor, two fcruples;
Effential oil of anifeed, one drachm;
Proof fpirit of wine, two pints.
Digeft for ten days, (mix and macerate for feven days, *Dub.*) and ftrain.

In this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin and effential oil. The latter will alfo render it more ftimulating; but whether it derives any falutary virtues from the former, we do not know. It was originally prefcribed under the title of Elixir Aftmaticum, which it does not ill deferve. It contributes to allay

the tickling which provokes frequent coughing; and at the ſame time it is ſuppoſed to open the breaſt, and give greater liberty of breathing. It is given to children againſt the chincough, &c. from five drops to twenty: to adults, from twenty to an hundred. Half an ounce, by meaſure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Ed.*
Tincture of Rhubarb.

Take of
Rhubarb, ſliced, three ounces;
Leſſer cardamom ſeeds, bruiſed, half an ounce;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA RHABARBARI. *Lond. Dub.*
Tincture of Rhubarb.

Take of
Rhubarb, cut into pieces, two ounces;
Leſſer cardamom ſeeds, bruiſed, (and huſked, *Dub.*)
Saffron, two drachms;
Proof ſpirit of wine, two pints, (two pounds, *Dub.*)
Digeſt for eight days, (ſeven days, *Dub.*) and ſtrain.

TINCTURA RHABARBARI COMPOSITA. *Lond.*
Compound Tincture of Rhubarb.

Take of
Rhubarb, ſliced, two ounces;
Liquorice root, bruiſed, half an ounce;
Ginger, powdered,
Saffron, each two drachms;
Diſtilled water, one pint;
Proof ſpirit of wine, twelve ounces, by meaſure.
Digeſt for fourteen days, and ſtrain.

TINCTURA RHEI ET ALOES; olim ELIXIR SACRUM. *Ed.*
Tincture of Rhubarb with Aloes, commonly called *Sacred Elixir.*

Take of
Rhubarb, ſliced, ten drachms;
Socotorine aloes, in powder, ſix drachms;
Leſſer cardamom ſeeds, bruiſed, half an ounce;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA RHEI ET GENTIANÆ; olim TINCTURA RHEI AMARA. *Ed.*

Tincture of Rhubarb with Gentian, formerly *Bitter Tincture of Rhubarb*.

Take of
Rhubarb, ſliced, two ounces;
Gentian root, ſliced, half an ounce;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

ALL the foregoing tinctures of rhubarb are deſigned as ſtomachics and corroborants, as well as purgatives: ſpirituous liquors excellently extract thoſe parts of the rhubarb in which the two firſt qualities reſide, and the additional ingredients conſiderably promote their efficacy. In weakneſs of the ſtomach, indigeſtion, laxity of the inteſtines, diarrhœas, colic, and other ſimilar complaints, theſe medicines are frequently of great ſervice.

TINCTURA SABINÆ COMPOSITA. *Lond.*

Compound Tincture of Savin.

Take of
Extract of ſavin, one ounce;
Tincture of caſtor, one pint;
———— myrrh, half a pint.
Digeſt till the extract of ſavin be diſſolved, and then ſtrain.

THIS preparation is improved from one deſcribed in ſome former Diſpenſatories under the name of Elixir Uterinum. It is ſaid to be a medicine of great importance in uterine obſtructions, and in hypochondriacal caſes; though, poſſibly, means might be contrived of ſuperadding more effectually the virtues of ſavin to a tincture of myrrh and caſtor. It may be given from five drops to twenty or thirty, or more, in any ſuitable vehicle.

TINCTURA SAPONIS; vulgo LINIMENTUM SAPONACEUM. *Ed.*

Tincture of Soap, formerly *Saponaceous Liniment*.

Take of
Soap, in ſhavings, four ounces;
Camphor, two ounces;
Volatile oil of roſemary, half an ounce.
Alcohol, two pounds.

Digeſt the ſoap in the alcohol for three days; then add to the filtered liquor the camphor and the oil, agitating them diligently.

LINIMENTUM SAPONIS COMPOSITUM. *Lond.*
Compound Soap Liniment.

Take of
Soap, three ounces;
Camphor, one ounce;
Spirit of roſemary, one pint.

Digeſt the ſoap in the ſpirit of roſemary until it be diſſolved, and add to it the camphor.

LINIMENTUM SAPONACEUM. *Dub.*
Sponaceous Liniment.

Take of
Caſtile ſoap, two ounces;
Camphor, one ounce;
Alcohol,
Water, each eight ounces;
Eſſential oil of roſemary, two ſcruples.

Diſſolve the ſoap in the water over a gentle fire; ſtrain the liquor through linen; and when it is almoſt cold, add the camphor and oil diſſolved in the alcohol.

Off. prep.—Linim volat. *Dub.*

TINCTURA SAPONIS ET OPII; olim LINIMENTUM ANODYNUM. *Ed.*
Tincture of Soap with Opium, formerly *Anodyne Liniment.*

THIS is prepared in the ſame way, and from the ſame ſubſtances, as the ſimple tincture of ſoap, but with the addition from the beginning of
Opium one ounce.

THESE tinctures are only uſed externally, and poſſeſs great efficacy in removing local pains, when rubbed on the affected part.

TINCTURA SCILLÆ. *Lond. Dub.*
Tincture of Squill.

Take of
Squills, freſh dried, four ounces;
Proof ſpirit of wine, two pints, (two pounds, *Dub.*)

(Digeſt for eight days, and pour off the liquor, *Lond.*)
(Mix and digeſt for ſeven days; then remove from the fire, and when the feces have ſubſided, pour off the pure liquor, *Dub.*)

The active principle of squills is soluble in alcohol, and there are cases in which a tincture may be useful.

TINCTURA SENNÆ COMPOSITA; vulgo ELIXIR SALUTIS. *Edin.*

Compound Tincture of Senna, commonly called *Elixir of Health.*

Take of
Senna leaves, two ounces;
Jalap root, bruised, one ounce;
Coriander seeds, bruised, half an ounce;
Diluted alcohol, three pounds and a half.
Digest for seven days, and to the liquor filtered through paper add,
Double refined sugar, four ounces.

TINCTURA SENNÆ. *Lond. Dub.*

Tincture of Senna.

Take of
Senna, one pound;
Caraway seeds, bruised, one ounce and a half;
Lesser cardamom seeds, bruised, (and husked, *Dub.*) half an ounce.
Raisins, stoned, sixteen ounces;
Proof spirit, one gallon, (nine pounds, *Dub.*)
Digest for fourteen days, and strain.

Both these tinctures are useful carminatives and cathartics, especially to those who have accustomed themselves to the use of spiritous liquors; they often relieve flatulent complaints and colics, where the common cordials have little effect; the dose is from one to two ounces.

TINCTURA TOLUIFERÆ BALSAMI; olim TINCTURA TOLUTANA. *Edin.* TINCTURA BALSAMI TOLUTANI. *Lond. Dub.*

Tincture of the Balsam of Tolu.

Take of
Balsam of Tolu, an ounce and a half, (one ounce, *Dub.*)
Alcohol, one pound, (one pint, *Lond.*)
Digest until the balsam be dissolved; and then strain the tincture through paper.

This solution of balsam of Tolu possesses all the virtues of the

balſam itſelf. It may be taken internally, with the ſeveral intentions for which that balſam is proper, to the quantity of a tea ſpoonful or two in any convenient vehicle. Mixed with ſimple ſyrup, it forms an elegant balſamic ſyrup.

Off. prep.—Syrupus Tol. balſ. *Ed.* Elect. catechu, *Dub.* Trochiſci glycr. cum opio, *Ed. Dub.*

TINCTURA VALERIANÆ. *Lond.*

Tincture of Valerian.

Take of

The root of wild valerian, in coarſe powder, four ounces;

Proof ſpirit of wine, two pints.

Digeſt with a gentle heat for eight days, and ſtrain.

The valerian root ought to be reduced to a pretty fine powder, otherwiſe the ſpirit will not ſufficiently extract its virtues. The tincture has a deep colour, and is ſtrongly impregnated with the valerian; though it has not been found to anſwer ſo well in the cure of epileptic diſorders as the root in ſubſtance, exhibited in the form of powder or bolus. The doſe of the tincture is from half a ſpoonful to a ſpoonful or more two or three times a-day.

TINCTURA VERATRI ALBI. *Ed.*

Tincture of White Hellebore.

Take of

White hellebore root, bruiſed, eight ounces;

Diluted alcohol, two pounds and a half.

Digeſt them together for ſeven days, and filter the tincture through paper.

This tincture is ſometimes uſed for aſſiſting cathartics, &c. and as an emetic in apoplectic and maniacal diſorders. It may likewiſe be ſo managed, as to prove a powerful alterative and deobſtruent, in caſes where milder remedies have little effect. But a great deal of caution is requiſite in its uſe: the doſe, at firſt, ought to be only a few drops; if conſiderable, it proves violently emetic or cathartic.

TINCTURA ZINGIBERIS. *Lond.*

Tincture of Ginger.

Take of

Ginger, powdered, two ounces;

Proof ſpirit, two pounds.

Digeſt in a gentle heat for eight days, and ſtrain.

This tincture is cordial and ftimulant, and is only employed as a corrigent to purgative draughts.

CHAP. XXXI.

TINCTURES made with ETHEREAL SPIRITS.

We have claffed thefe tinctures by themfelves, becaufe they are more ftrongly characterifed by the nature of the menftruum than of the fubftances diffolved in it. Indeed, the ethereal fpirits are ufed in thefe inftances, not to diffolve bodies which would refift the action of alcohol and water, but for the fake of their own direct action on the body.

TINCTURA ALOES ÆTHEREA. *Ed.*

Ethereal Tincture of Aloes.

Take of
Socotorine aloes,
Myrrh, of each, in powder, one ounce and a half;
Englifh faffron, fliced, one ounce;
Sulphuric ether with alcohol, one pound.

Digeft the myrrh with the fulphuric ether with alcohol for four days, in a clofe veffel; then add the faffron and aloes.

Digeft again for four days, and, when the feces have fubfided, pour off the tincture.

This tincture agrees generally in its effects with the other tinctures of aloes, the only difference arifing from the more penetrating and ftimulating nature of the menftruum itfelf.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS. *Edin.*

Aromatic Sulphuric Ether with Alcohol.

This is made of the fame aromatics, and in the fame manner, as the compound tincture of cinnamon; except, that, in place of alcohol, fulphuric ether with alcohol is employed.

This is deſigned for perſons whoſe ſtomachs are too weak to bear the following acid tincture: to the taſte, it is gratefully aromatic, without any perceptible acidity.

ACIDUM SULPHURICUM AROMATICUM. *Edin.*
Aromatic Sulphuric Acid.

Take of
Alcohol, two pounds;
Sulphuric acid, ſix ounces;
Drop the acid gradually into the alcohol. Digeſt the mixture with a very gentle heat in a cloſe veſſel for three days, and then add, of
Cinnamon, bruiſed, an ounce and a half;
Ginger, bruiſed, one ounce.
Digeſt again in a cloſe veſſel for ſix days, and then filter the tincture through paper placed in a glaſs funnel.

Although the name given to this preparation by the college does not ſanction its arrangement with the ethereal tinctures, yet we have ventured to place it here, from the belief that the alcohol is completely or partially changed, by the digeſtion with the acid, into an ethereal ſpirit, and that the principal difference between this and the preceding tincture conſiſts in the preſence of the acid, which is not to be conſidered as the menſtruum by which the tincture is formed, but as an acid mixed with the ethereal tincture.

Med. uſe.—This is a valuable medicine in weakneſs and relaxations of the ſtomach, and decays of conſtitution, particularly in thoſe which proceed from irregularities, which are accompanied with ſlow febrile ſymptoms, or which follow the ſuppreſſion of intermittents. It frequently ſucceeds, after bitters and aromatics by themſelves had availed nothing; and, indeed, great part of its virtues depend on the ſulphuric acid; which, barely diluted with water, has, in thoſe caſes where the ſtomach could bear the acidity, produced happy effects.

It is very uſefully conjoined with cinchona, and other tonic barks, both as covering their diſagreeable taſte, and as coinciding with them in virtue. It may be given in doſes of ten to thirty drops, or more, ſeveral times a-day.

CHAP. XXXII.

AMMONIATED or VOLATILE TINCTURES.

AMMONIA, like ether, is ſo powerful an agent on the living ſyſtem, that we think it gives a peculiar character to the compoſitions into which it enters. They are all highly ſtimulating and pungent, and apt to excite diaphoreſis. As ammonia exerts conſiderable and peculiar powers as a ſolvent, theſe tinctures muſt never be combined in preſcription with any thing acid, which would not only neutralize the ammonia, and deſtroy its peculiar action on the living ſyſtem, but would precipitate whatever was diſſolved by its agency.

LINIMENTUM CAMPHORÆ COMPOSITUM. *Lond.*

Compound Camphor Liniment.

Take of

Camphor, two ounces;
Water of pure ammonia, ſix ounces;
Spirit of lavender, ſixteen ounces.

Mix the water of ammonia with the ſpirit; and diſtil from a glaſs retort, with a ſlow fire, ſixteen ounces. Then diſſolve the camphor in the diſtilled liquor.

LINIMENTUM CAMPHORATUM. *Dub.*

Camphorated Liniment.

Take of

Camphor, three ounces;
Ley of aërated volatile alkali, ten ounces;
Spirit of lavender, two pounds.

Mix the ley and the ſpirit; and diſtil from a glaſs retort, with a gentle heat, two pounds. Then diſſolve the camphor in the diſtilled liquor.

THESE compoſitions are more pungent and penetrating than the ſolutions of camphor in alcohol. In the quarto impreſſion of their Pharmacopœia, the London college employed the ſolution of carbonated ammonia, but changed it in the octavo edition for the

water of pure ammonia, which is certainly an improvement. Indeed I never made the experiment; but, from analogy, I ſhould be inclined to think that the carbonated ammonia is incapable of diſſolving the camphor.

LINIMENTUM VOLATILE. *Dub.*
Volatile Liniment.

Take of
The aromatic ſpirit of volatile alkali, one ounce;
Liniment of ſoap, two ounces;
Mix them.

THIS is an entirely different compoſition from the volatile liniment of the Edinburgh and London pharmacopœias. The latter is a ſoap formed of ammonia and fixed oil, whereas the preſent is an ammoniated tincture of camphor, ſoap of ſoda, and volatile oils. In its effects it differs from the ſoap-liniment of the Dublin college only in being more ſtimulating.

ALCOHOL AMMONIATUM AROMATICUM, SIVE SPIRITUS AMMONIÆ AROMATICUS. *Ed.*
Aromatic Ammoniated Alcohol, or *Aromatic Spirit of Ammonia.*

Take of
Ammoniated alcohol, eight ounces;
Volatile oil of roſemary, one drachm and a half;
Volatile oil of lemon-peel, one drachm.
Mix them that the oils may be diſſolved.

SPIRITUS AMMONIÆ COMPOSITUS. *Lond.*
Compound Spirit of Ammonia.

Take of
Spirit of ammonia, two pints;
Eſſential oil of lemon,
———— cloves, of each two drachms;
Mix them.

SPIRITUS ALKALI VOLATILIS AROMATICUS. *Dub.*
Aromatic Spirit of Volatile Alkali.

Take of
Spirit of volatile alkali, two pounds;
Eſſential oil of lemon,
———— nutmeg, of each two drachms.
Mix them.

Medicines of this kind might be prepared extemporaneoufly, by dropping any proper volatile oil into ammoniated alcohol, which will readily diffolve the oil, if the ammonia in the folvent be cauftic; for if it be carbonated, fuch as it always is when prepared according to the directions of the London college, it does not diffolve the oils here ordered, and is therefore totally unfit for this preparation.

Med. ufe.—Ammonia thus united with aromatics, is not only more agreeable in flavour, but likewife more acceptable to the ftomach, and lefs acrimonious than when uncombined. The dofe is from five or fix drops to fixty or more.

Off. prep.—Linim volat. *Dub.* Tinct. cinchon. ammon. *Lond.* Tinctura guaiaci, *Lond. Dub.* Tinct. val. ammon. *Lond. Dub.*

SPIRITUS AMMONIÆ SUCCINATUS. *Lond.*
Succinated Spirit of Ammonia.

Take of
Alcohol, one ounce, by weight;
Water of pure ammonia, four ounces, by meafure;
Rectified oil of amber, one fcruple, by weight;
Soap, ten grains.

Digeft the foap and oil of amber in the alcohol till they be diffolved: then add the water of pure ammonia, and mix them by fhaking.

This preparation is intended as a fubftitute for Eau de Luce, which was formerly imported entirely from Paris. It is now, we believe, prepared alfo by the chemifts and druggifts in London; but without fome peculiar manipulation, which is kept fecret, the above formula does not fucceed in giving the liquor that permanent milky opacity, which is deemed effential to good Eau de Luce, for it becomes more or lefs tranfparent by keeping This fancied perfection, is, however, in a medical point of view, immaterial; and whether it be opaque or tranfparent, it is an excellent analeptic remedy, and may be ufed in the fame circumftances, and in the fame dofes, as the fpirit of ammonia itfelf.

TINCTURA CASTOREI COMPOSITA. *Ed.*
Compound Tincture of Caftor.

Take of
Ruffia caftor, in powder, one ounce;
Affa fœtida, half an ounce;
Ammoniated alcohol, one pound.

Digeft for feven days, and filter through paper.

This compofition is a medicine of real efficacy, particularly in hyfterical diforders, and the feveral fymptoms which accompany them. The fpirit here ufed is an excellent menftruum, both for the caftor and the affa fœtida, and greatly adds to their virtues.

TINCTURA CINCHONÆ AMMONIATA. *Lond.*

Ammoniated Tincture of Cinchona.

Take of
Cinchona, powdered, four ounces;
Compound fpirit of ammonia, two pints.
Digeft in a clofe veffel for ten days, and ftrain.

We are not acquainted with this tincture; but from our knowledge of the active principles of cinchona bark, we are not difpofed to think it a very judicious preparation; for the nature of the menftruum is fo ftimulating, that little effect can be expected from any portion of the cinchona it is capable of diffolving.

TINCTURA GUAIACI AMMONIATA. *Ed.*

Ammoniated Tincture of Guaiac.

Take of
Refin of guaiac, in powder, four ounces;
Ammoniated alcohol, one pound and a half.
Digeft for feven days, and filter through paper.

Tinctura Guaiaci. *Lond.* Tinct. Guaiaci Volatilis. *Dub.*

Tincture of Guaiac. Volatile Tincture of Guaiac.

Take of
Gum guaiacum, four ounces;
Compound fpirit of ammonia, a pint and a half, (one pound and a half, *Dub.*)
Digeft for three days, and ftrain, *Lond.*
Mix and macerate for feven days, in a veffel clofely covered, then filter, *Dub.*

These are very elegant and efficacious tinctures; the ammoniated fpirit readily diffolving the refin, and at the fame time promoting its medicinal virtue. In rheumatic cafes, a tea, or even table, fpoonful, taken every morning and evening in any convenient vehicle, particularly in milk, has proved of fingular fervice.

TINCTURA OPII AMMONIATA; olim ELIXIR PAREGORICUM. *Ed.*

Ammoniated Tincture of Opium, formerly *Paregoric Elixir.*

Take of
Benzoic acid,
English saffron, sliced, of each three drachms;
Opium, two drachms;
Volatile oil of aniseed, half a drachm;
Ammoniated alcohol, sixteen ounces.
Digest for seven days, in a close vessel, and filter through paper.

THIS is a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c. the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium.

TINCTURA VALERIANÆ AMMONIATA. *Lond. Dub.*

Ammoniated Tincture of Valerian.

Take of
Wild valerian, in coarse powder, four ounces;
Compound spirit of ammonia, two pints.
Digest for eight days, (seven days, in a vessel closely covered, *Dub.*) and strain.

THE compound spirit of ammonia is here an excellent menstruum, and at the same time considerably promotes the virtues of the valerian, which in some cases wants assistance of this kind. The dose may be a tea spoonful or two.

CHAP. XXXIII.

MEDICATED WINES.

PARMENTIER has occupied thirty-two pages of the Annales de Chimie, to prove that wine is an extremely bad menstruum for extracting the virtues of medical substances. His argument, (for there is but one), is, that by the infusion of vegetable

fubftances in wine, its natural tendency to decompofition is fo much accelerated, that at the end of the procefs, inftead of wine, we have only a liquor containing the elements of bad vinegar. As a folvent, diluted alcohol perfectly fuperfedes the ufe of wine; and if we wifh to ufe wine to cover the tafte, or to affift the operation of any medicine, M. Parmentier propofes, that a tincture of the fubftance fhould be extemporaneoufly mixed with wine as a vehicle.

Notwithftanding this argument appears to us to have great weight, we fhall give to the medicated wines, retained in the pharmacopœias, the characters they ftill generally poffefs.

VINUM ALOES SOCOTERINÆ; vulgo TINCTURA SACRA. *Ed.*

Wine of Socoterine Aloes, commonly called *Sacred Tincture*.

Take of
- Socotorine aloes, in powder, one ounce;
- Leffer cardamom feeds, bruifed,
- Ginger, bruifed, each one drachm;
- Spanifh white wine, two pounds.

Digeft for feven days, ftirring now and then, and afterwards ftrain.

VINUM ALOETICUM. *Dub.*

Aloetic Wine.

Take of
- Socotorine aloes, four ounces;
- Canella alba, two ounces;
- Spanifh white wine, four pounds.

Powder the aloes and canella alba feparately, then mix and pour on the wine, afterwards digeft for fourteen days, frequently fhaking the veffel; and, laftly, filter the liquor.

VINUM ALOES. *Lond.*

Wine of Aloes.

Take of
- Socotorine aloes, eight ounces;
- Canella alba, two ounces;
- Spanifh white wine, fix pints;
- Proof fpirit, two pints.

Powder the aloes and canella feparately; mix them and pour on the wine and fpirit: digeft for fourteen days, now and then fhaking them; and ftrain.

It is proper to mix white ſand, cleanſed from impurities, with the powder, in order to prevent the moiſtened aloes from ſticking together.

This medicine has long been in great eſteem, not only as a cathartic, but likewiſe as a ſtimulus.

It appears from long experience to be a medicine of excellent ſervice. The doſe, as a purgative, is from one to two ounces. It may be introduced into the habit, ſo as to be productive of excellent effects, as an alterant, by giving it in ſmall doſes, at proper intervals: thus managed, it does not for a conſiderable time operate remarkably by ſtool; but at length proves purgative, and occaſions a lax habit of much longer continuance than that produced by the other common cathartics.

VINUM GENTIANÆ COMPOSITUM; vulgo Vinum Amarum. *Ed.*

Compound Wine of Gentian, commonly called *Bitter Wine.*

Take of
Gentian root, half an ounce;
Cinchona bark, one ounce;
Seville orange peel, dried, two drachms;
Canella alba, one drachm;
Diluted alcohol, four ounces;
Spaniſh white wine, two pounds and a half;
Firſt pour the diluted alcohol on the root and barks ſliced and bruiſed, and after twenty-four hours add the wine; then macerate for ſeven days, and ſtrain.

This wine, which is a pleaſant bitter, is intended as a ſubſtitute for the old *Tinctura ad Stomachicos.* Wines of this kind are ſometimes introduced at the tables of epicures in Italy, to aſſiſt the ſtomach in digeſtion.

VINUM IPECACUANHÆ. *Lond. Dub.*

Wine of Ipecacuanha.

Take of
The root of ipecacuan, bruiſed, two ounces;
Spaniſh white wine, two pints, (two pounds, *Dub.*)
Digeſt for ten days, (ſeven days, *Dub.*) and ſtrain.

Ed.

Take of
Ipecacuan, bruiſed, one ounce;
Spaniſh white wine, fifteen ounces.
Macerate for ſeven days, and filter through paper.

Both theſe wines are very mild and ſafe emetics, and equally ſerviceable in dyſenteries, with the ipecacuanha in ſubſtance; this root yielding nearly all its virtues to the Spaniſh white wine. The common doſe is an ounce, more or leſs, according to the age and ſtrength of the patient.

VINUM NICOTIANÆ TABACI. *Ed.*
Tobacco Wine.

Take of
The dried leaves of tobacco, one ounce;
Spaniſh white wine, one pound.
Macerate for ſeven days, and ſtrain the liquor through paper.

Wine ſeems to extract more fully the active principles of the tobacco than either water or ſpirit taken ſeparately.

VINUM RHEI PALMATI. *Ed.*
Rhubarb Wine.

Take of
Rhubarb, ſliced, two ounces;
Canella alba, bruiſed, one drachm;
Diluted alcohol, two ounces;
Spaniſh white wine, fifteen ounces.
Macerate for ſeven days, and ſtrain through paper,

Vinum Rhabarbari. *Lond.*
Wine of Rhubarb.

Take of
Sliced rhubarb, two ounces and a half;
Leſſer cardamom ſeeds, bruiſed and huſked, half an ounce;
Saffron, two drachms;
Spaniſh white wine, two pints;
Proof ſpirit, half a pint.
Digeſt for ten days, and ſtrain.

By aſſiſting the ſolvent power of the wine, the proof ſpirit in the above formulæ is a very uſeful addition. This is a warm, cordial, laxative medicine. It is uſed chiefly in weakneſs of the ſtomach and bowels, and ſome kinds of looſeneſſes, for evacuating the offending matter, and ſtrengthening the tone of the viſcera. It may be given in doſes of from half a ſpoonful to three or four ſpoonfuls or more, according to the circumſtances of the diſorder, and the ſtrength of the patient.

CHAP. XXXIV.

EXTRACTS and RESINS.

EXTRACT in pharmacy has long been uſed, in the common and true acceptation of the term, to expreſs a thing extracted, and therefore it was applied to ſubſtances of all kinds which were extracted from heterogeneous bodies, by the action of any menſtruum, and again reduced to a conſiſtent form, by the evaporation of that menſtruum. Lately, however, Extract has been uſed in a different and much more limited ſenſe, as the name for a peculiar principle, which is often indeed contained in extracts, and which before had no proper appellation. It is in the former ſenſe that we employ it here, and in which we wiſh it to be only uſed, while a new word ſhould be invented as the name of the new ſubſtance. Till a better be propoſed, we ſhall call it *extractive.*

Extracts are of various kinds, according to the nature of the ſubſtances from which they are obtained, and the menſtruum employed; but they commonly conſiſt of gum, ſugar, extractive, tannin, cinchonin, gallic acid, or reſin, or ſeveral of them mixed in various proportions. The menſtrua moſt commonly employed are water and alcohol. The former is capable of extracting all the ſubſtances enumerated, except the reſin, and the latter all except the gum. Wine is alſo ſometimes employed, but very improperly; for as a ſolvent it can only act as a mixture of alcohol and water, and the principles which it leaves behind on evaporation are rather injurious than of advantage to the extract.

Water is the menſtruum moſt economically employed in making extracts, as it is capable of diſſolving all the active principles except reſin, and can have its ſolvent powers aſſiſted by a conſiderable degree of heat.

Watery extracts are prepared by boiling the ſubject in water, and evaporating the ſtrained decoction to a thick conſiſtence.

It is indifferent, with regard to the medicine, whether the ſubject be uſed freſh or dry; ſince nothing that can be preſerved in this proceſs will be loſt by drying. With regard to the facility of extraction, however, there is a very conſiderable difference; veget-

ables in general giving out their virtues more readily when moderately dried than when freſh.

Very compact dry ſubſtances ſhould be reduced into exceedingly ſmall parts, previous to the affuſion of the menſtruum.

The quantity of water ought to be no greater than is neceſſary for extracting the virtues of the ſubject. This point, however, is not very eaſily aſcertained; for although ſome of the common principles of extracts be ſoluble in a very ſmall proportion of water, there are others, ſuch as the tannin, of which water can diſſolve only a certain proportion, and cannot be made to take up more by any length of boiling; beſides we have no very good method of knowing when we have uſed a ſufficient quantity of water; for vegetable ſubſtances will continue to colour deeply ſucceſſive portions of water boiled with them, long after they are yielding nothing to it but colouring matter. Perhaps one of the beſt methods is to boil the ſubject in ſucceſſive quantities of water, as long as the decoctions form a conſiderable precipitate with the teſt which is proper for detecting the ſubſtance we are extracting, ſuch as a ſolution of gelatin for tannin, of alum for extractive, &c.

" The decoctions are to be depurated by colature; and after-
" wards ſuffered to ſtand for a day or two, when a conſiderable
" quantity of ſediment is uſually found at the bottom. If the
" liquor poured off clear be boiled down a little, and afterwards
" ſuffered to cool again, it will depoſite a freſh ſediment, from
" which it may be decanted before you proceed to finiſh the eva-
" poration. The decoctions of very reſinous ſubſtances do not
" require this treatment, and are rather injured by it; the reſin
" ſubſiding along with the inactive dregs."

Such were the directions given in the former editions of this work for the depuration of the decoctions, and we have inſerted them at full length, becauſe, although we doubt very much of their propriety, our reaſons for ſo doing are ſcarcely more than hypothetical. We would adviſe the decoctions to be evaporated after they have been filtered boiling hot, without any further depuration; becauſe ſome of the moſt active principles of vegetable ſubſtances, ſuch as tannin, are much more ſoluble in boiling than in cold water, and becauſe almoſt all of them are very quickly affected by expoſure to the atmoſphere. Therefore, if a boiling decoction, ſaturated with tannin, be allowed to cool, the greateſt part of the very principle on which the activity of the ſubſtance depends will ſeparate to the bottom, and according to the above directions, will be thrown away as ſediment. The ſame objection applies more ſtrongly to allowing the decoction to cool, and

depoſite a freſh ſediment, after it has been partially evaporated. Beſides, by allowing the decoctions to ſtand ſeveral days before we proceed to their evaporation, we are in fact allowing the active principles contained in the decoction to be altered by the action of the air, and to be converted into ſubſtances, perhaps inactive, which alſo are thrown away as ſediment.

The evaporation is moſt conveniently performed in broad ſhallow veſſels; the larger the ſurface of the liquor, the ſooner will the aqueous parts exhale. This effect may likewiſe be promoted by agitation.

When the matter begins to grow thick, great care is neceſſary to prevent its burning. This accident, almoſt unavoidable if the quantity be large, and the fire applied as uſual under the evaporating baſon, may be effectually prevented, by carrying on the inſpiſſation, after the common manner, no further than to the conſiſtence of a ſyrup, when the matter is to be poured into ſhallow tin or earthen pans, and placed in an oven, with its door open, moderately heated; which acting uniformly on every part of the liquid, will ſoon reduce it to any degree of conſiſtence required. This may likewiſe be done, and more ſecurely, by ſetting the evaporating veſſel in boiling water; but the evaporation is in this way very tedious.

Alcohol is much too expenſive to be employed as a menſtruum for obtaining extracts, except in thoſe caſes where water is totally inadequate to the purpoſe. Theſe caſes are,

1ſt, When the nature of the extract is very periſhable when diſſolved in water, ſo that it is liable to be decompoſed before the evaporation can be completed, eſpecially if we cannot proceed immediately to the evaporation.

2dly, When water is totally incapable of diſſolving the ſubſtance to be extracted; and,

3dly, When the ſubſtance extracted can bear the heat of boiling alcohol without being evaporated, but would be diſſipated by that of boiling water; that is, when it requires a heat greater than 176°, and leſs than 212°, for its vaporization.

In the laſt caſe, the alcohol muſt be perfectly free from water, becauſe the heat neceſſary to evaporate it at the end of the proceſs would fruſtrate the whole operation. Hence, alſo, the ſubject itſelf ought always to be dry: thoſe ſubſtances which loſe their virtue by drying, loſe it equally on being ſubmitted to this treatment with the pureſt alcohol.

In this way the alcoholic extract of ſome aromatic ſubſtances, as cinnamon, lavender, roſemary, retain a conſiderable degree of their fine flavour.

In the ſecond caſe, the alcohol need not be ſo very ſtrong, be-

cauſe it is ſtill capable of diſſolving reſinous ſubſtances, although diluted with a conſiderable proportion of water.

In the firſt caſe, the alcohol may be ſtill much weaker; or rather, the addition of a ſmall proportion of alcohol to water will be ſufficient to retard or prevent the decompoſition of the decoction.

The alcohol employed in all theſe caſes ſhould be perfectly free from any unpleaſant flavour, leſt it be communicated to the extract.

The inſpiſſation ſhould be performed from the beginning, in the gentle heat of a water-bath. We need not ſuffer the alcohol to evaporate in the air: the greateſt part of it may be recovered by collecting the vapour in common diſtilling veſſels. If the diſtilled ſpirit be found to have brought over any flavour from the ſubject, it may be advantageouſly reſerved for the ſame purpoſes again.

When diluted alcohol is employed, the diſtillation ſhould only be continued as long as alcohol comes over; and the evaporation ſhould be finiſhed in wide open veſſels.

In this chapter we have alſo included the proceſſes intended for purifying inſpiſſated juices and reſinous ſubſtances.

Pure reſins are prepared, by adding to ſpirituous tinctures of reſinous vegetables, a large quantity of water. The reſin, incapable of remaining diſſolved in the watery liquor, ſeparates and falls to the bottom; leaving in the menſtruum ſuch other principles of the plant as the ſpirit might have extracted at firſt along with it. But this is only practiſed for the purpoſe of analyſis.

EXTRACTS made with WATER only.

EXTRACTUM GENTIANÆ LUTEÆ. *Edin.*

Extract of Gentian.

Take of

Gentian root, any quantity.

Having cut and bruiſed it, pour upon it eight times its quantity of diſtilled water. Boil to the conſumption of one half of the liquor, and ſtrain it by ſtrong expreſſion. Evaporate the decoction immediately to the conſiſtence of thick honey, in a bath of water ſaturated with muriate of ſoda.

EXTRACTA. *Lond.*
Extracts.

Boil the article in diſtilled water, preſs out the decoction, ſtrain it and ſet it apart that the feces may ſubſide; then boil it again in a water-bath ſaturated with ſea ſalt to a conſiſtence proper for making pills.

The ſame kind of bath is to be uſed in the preparation of all the extracts, that the evaporation may be properly performed.

EXTRACTA SIMPLICIORA. *Dub.*
Simple Extracts.

All ſimple extracts, unleſs otherwiſe ordered, are to be prepared according to the following rule:

The parts of the plants ordered are to be boiled in water; the liquor is then to be expreſſed, and after the feces have ſubſided, it is to be filtered; and laſtly, it is to be evaporated with a gentle heat, and frequently ſtirred, until it acquire a conſiſtence proper for forming pills.

In this manner are prepared,

Extracta	Extracts of
Radicis Glycyrrhizæ glabræ. *Ed.* Glycyrrhizæ. *Lond. Dub.*	the roots of Liquorice
—— Hellebori Nigri. *Ed. Dub. Lond.*	—— Black Hellebore.
Radicis Gentianæ. *Lond. Dub.*	the roots of Gentian.

Off. prep.—Pulvis aloeticus cum ferro. *Lond.* Pil aloet. *Dub. Lond.* Pil ſtib. comp. *Dub.*

—— Jalapæ. *Dub.*	—— Jalap.
Foliorum Rutæ Graveolentis. *Ed.* Rutæ. *Lond. Dub.*	Leaves of Rue.
—— Cassiæ Sennæ. *Ed.*	—— Senna.
—— Sabinæ. *Lond. Dub.*	—— Savin.

Off. prep.—Tinct. Sabinæ comp. *Lond.*

Florum Anthemidis Nobilis. *Ed.* Chamæmeli. *Lond. Dub.*	of the flowers of Chamomile.

EXTRACTA	Extracts
Capitum PAPAVERIS SOMNIFERI.	of the heads of White Poppy.
PAPAVERIS ALBI. *Lond.*	
Cacuminorum GENISTÆ. *Lond.*	Broom tops.
Ligni HÆMATOXYLI CAMPECH. *Ed.*	Logwood.
HÆMATOXYLI. *Dub.*	
Corticis QUERCUS. *Dub.*	Oak bark.
Gummi resinæ ALOES	Aloes.

EXTRACTUM CINCHONÆ, SIVE CORTICIS PERUVIANI. *Lond.*

Extract of Cinchona, or Peruvian Bark.

Take of
- Peruvian bark, in coarse powder, one pound;
- Distilled water, twelve pints.

Boil for an hour or two, and pour off the liquor, which, while hot, will be red and pellucid, but, as it grows cold, will become yellow and turbid. The same quantity of water being again poured on, boil the bark as before, and repeat the boiling until the liquor, on becoming cold, remains clear. Then reduce all these liquors, mixed together and strained, to a proper thickness, by evaporation.

This extract must be prepared under two forms; one *soft*, and fit for making pills; the other *hard* and pulverisable.

EXTRACTUM CORTICIS PERUVIANI DURUM. *Dub.*

Hard Extract of Peruvian Bark.

Take of
- Peruvian bark, in coarse powder, one pound;
- Water, twelve pounds.

Mix and boil to the half; then strain the liquor still boiling. What remains upon the filter is to be again boiled with fresh affusions of water, as often as may be necessary. Lastly, evaporate all the decoctions, mixed and filtered, after they have cooled, until the extract become so hard as to be reducible to powder.

EXTRACTUM CORTICIS PERUVIANI MOLLE. *Dub.*

Soft Extract of Peruvian Bark.

This is prepared in the same manner, except that the extract is made no drier than to render it fit for the formation of pills.

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EXTRACTUM HÆMATOXYLI, SIVE LIGNI CAMPECHENSIS. *Lond.*

Extract of Logwood.

Take of

Shavings of logwood, one pound.

Boil it four times, or oftener, in a gallon of diftilled water, to one half; then boil all the liquors, mixed and ftrained, down to a proper confiftence.

EXTRACTUM OPII. *Dub.*

Extract of Opium.

Take of

Purified opium, two ounces;

Boiling water, one pound.

Melt the opium in the water, and to the liquor ftrained, while it is warm, add one pound of cold diftilled water. Expofe this liquor for two days to the air, filter it again, and, laftly, evaporate it to the confiftence of an extract over a very gentle fire.

EXTRACTUM SENNÆ. *Lond.*

Extract of Senna.

Take of

Senna, one pound;

Diftilled water, one gallon.

Boil the fenna in the diftilled water, adding after its decoction a little rectified fpirit of wine. Evaporate the ftrained liquor to a proper thicknefs.

Dub.

Take of

Senna, one pound;

Water, eight pounds;

Rectified fpirit of wine, eight ounces;

Boil the fenna in the water to one half; add the fpirit to the decoction after it is cold, and digeft in a covered veffel for twenty-four hours, then exprefs the liquor, and evaporate it to a proper thicknefs over a very gentle fire.

EXTRACTS made with ALCOHOL and WATER.

EXTRACTUM CINCHONÆ OFFICINALIS. *Ed.*

Extract of Cinchona.

Take of
Cinchona bark, in powder, one pound;
Alcohol, four pounds.

Digeſt for four days, and pour off the tincture.

Boil the reſiduum in five pounds of diſtilled water for fifteen minutes, and filter the decoction boiling hot through linen. Repeat this decoction and filtration with the ſame quantity of diſtilled water, and reduce the liquor by evaporation to the conſiſtence of thin honey.

Draw off the alcohol from the tincture by diſtillation, until it alſo become thick; then mix the liquors, thus inſpiſſated, and evaporate them in a bath of boiling water, ſaturated with muriate of ſoda, to a proper conſiſtency.

EXTRACTUM CONVOLVULI JALAPÆ. *Ed.*

Extract of Jalap

Is prepared in the ſame way, from the bruiſed root.

EXTRACTUM CORTICIS PERUVIANI CUM RESINA. *Lond.*

Extract of Peruvian Bark with the Reſin.

Take of
Peruvian bark, reduced to coarſe powder, one pound;
Rectified ſpirit of wine, four pints.

Digeſt it for four days, and pour off the tincture; boil the reſiduum in ten pints of diſtilled water to two; then ſtrain the tincture and decoction ſeparately, evaporating the water from the decoction, and diſtilling off the ſpirit from the tincture, until each begins to be thickened. Laſtly, mix the reſinous with the aqueous extract, and make the maſs fit for forming into pills.

In the ſame way are prepared

EXTRACTUM CASCARILLÆ. *Lond.* *Extract of Caſcarilla.*

EXTRACTUM JALAPII. *Lond.* *Extract of Jalap.*

Off. prep.—Pulv. ſcam. comp. *Lond.* Pulv. ſcam. cum aloe, *Lond.*

EXTRACTUM CASCARILLÆ RESINOSUM. *Dub.*
Reſinous Extract of Caſcarilla.

Take of
Caſcarilla, in coarſe powder, one pound;
Rectified ſpirit of wine, four pounds.

Digeſt for four days, then pour off the tincture and ſtrain; boil the reſiduum in twelve pounds of water to two, and purify this liquor in the ſame way as the former. Evaporate the decoction, and diſtil the tincture till both begin to grow thick; and laſtly, mix them well together.

In this way are prepared,

EXTRACTUM CORTICIS PERUVIANI RUBRI RESINOSUM. *Dub.*
Reſinous Extract of Red Peruvian Bark.

EXTRACTUM VALERIANÆ SYLVESTRIS RESINOSUM. *Dub.*
Reſinous Extract of Wild Valerian.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. *Lond.*
Compound Extract of Coloquintida.

Take of
Pith of coloquintida, cut ſmall, ſix drachms;
Socotorine aloes, powdered, an ounce and a half;
Scammony, powdered, half an ounce;
Smaller cardamom ſeeds, huſked and powdered, one drachm;
Proof ſpirit, one pint.

Digeſt the coloquintida in the ſpirit, with a gentle heat, during four days. To the expreſſed tincture add the aloes and ſcammony; when theſe are diſſolved, draw off the ſpirit by diſtillation, and evaporate the water, adding the ſeeds towards the end of the proceſs, ſo as to form an extract fit for making into pills.

OPIUM PURIFICATUM. *Lond. Dub.*
Purified Opium.

Take of
Opium, cut into ſmall pieces, one pound;
Proof ſpirit of wine, twelve pints.

Digeſt the opium with a gentle heat, ſtirring now and then till it be diſſolved, and filter through paper. Diſtil the tincture, ſo prepared, to a proper thickneſs, (for making into pills, *Dub.*)

(Purified opium muſt be kept in two forms: one *ſoft*, proper for forming into pills; the other *hard*, which may be reduced into powder, *Lond.*)

Off. prep.—Extract. opii, *Dub.* Pulv. cret. cum opio, *Lond.* Pulv. ipec. et opii, *Lond. Dub.* Pulv. opiat, *Lond.*

The chapter on extracts and reſins in the London Pharmacopœia is concluded with the two following general directions:

1. All the extracts, during the time of inſpiſſation, muſt be gently agitated.

2. On all the ſofter watery extracts, a ſmall quantity of ſpirit of wine muſt be ſprinkled.

All theſe extracts are ſuppoſed to contain the virtues of the ſubſtances from which they are prepared, in a very pure and concentrated form: but this ſuppoſition is, probably in ſeveral inſtances, erroneous; and the directions for preparing them are frequently injudicious and uneconomical.

As the changes which opium and aloes undergo by ſolution, and ſubſequent evaporation, have never been aſcertained by careful and ſatisfactory experiments, well ſelected pieces of theſe ſubſtances are to be preferred to the preparations in which they are ſuppoſed to be purified.

Cinchona bark is a medicine of very great importance; but unfortunately the proportion of woody fibres, or inert matter, which enter into its compoſition is ſo great, that weak ſtomachs cannot bear it, when given in quantity ſufficient to produce any very powerful effects. On this account, the preparation of an extract, which may contain its active principles in a concentrated form, becomes alſo an object of importance. On this ſubject there is ſtill much room for experiment. The London and Dublin colleges, in their directions, certainly err in two important particulars; in the firſt place, in deſiring the decoction to be continued until the greateſt part of the menſtruum is evaporated; and, in the ſecond place, in ſeparating by filtration the powder which ſeparates from the decoction after it has cooled. The firſt error probably originated in the idea, that by continuing the boiling for a great length of time more of the bark would be diſſolved; but it is now known, that water is incapable of diſſolving more than a certain

quantity of the active principles of cinchona: and that after the water has become ſaturated, by continuing the decoction we diminiſh the quantity of the menſtruum, and therefore alſo diminiſh the quantity of bark diſſolved. It is not eaſy to account for the ſecond error; for, according to the old idea, that the powder which ſeparated on cooling from a ſaturated decoction of cinchona, was a reſinous ſubſtance, it ſurely ought not to have been rejected from what were ſuppoſed to be reſinous extracts. This precipitate is now known to be cauſed by the much greater ſolubility of its active principles in boiling, than in cold water, ſo that the precipitate is not different from what remains in ſolution. Accordingly I have found by experiment, that cinchona gave at leaſt one half more extract when the decoction was conducted according to the directions of the Edinburgh college.

The real advantage of ſo expenſive an agent as alcohol, in preparing any of theſe extracts, has not been demonſtrated; and, if I be not miſinformed, it is ſeldom employed by the apothecaries in preparing even what are called the Reſinous Extracts.

RESINA FLAVA. *Lond. Dub.*
Yellow Roſin.

This remains in the retort after the diſtillation of oil of turpentine.

Turpentines are combinations of volatile oil and reſins, which are eaſily ſeparated by diſtillation. The proceſs, however, cannot be carried ſo far as to ſeparate the whole of the oil, without charring and burning the reſin. In this ſtate it has a brown colour and a certain degree of tranſparency; and is well known under the name of Fidlers roſin. But, if water be added to the reſiduum of the diſtillation, and be thoroughly mixed with it by agitation, it becomes opaque, and is called Yellow Roſin.

Yellow roſin is a uſeful ingredient in the compoſition of plaſters and hard ointments.

AMMONIACI PURIFICATIO. *Lond.*
The Purification of Gum Ammoniacum.

If gum ammoniac do not ſeem to be pure, boil it in water till it become ſoft; then ſqueeze it through a canvaſs bag, by means of a preſs. Let it remain at reſt till the reſinous part ſubſide; then evaporate the water; and towards the end of the evaporation, mix the reſinous part with the gummy.

In the ſame manner are purified *aſſa fœtida* and ſimilar *gum reſins*.

You may alſo purify any gum which melts eaſy, ſuch as *Galbanum*, by putting it in an ox bladder, and holding it in boiling

water till it becomes ſo ſoft that it can be ſeparated from its impurities by preſſing it through a coarſe linen cloth.

As one, and perhaps the moſt active conſtituent of gummy reſins, as they are called, is of a volatile nature, it is evident that it muſt be in a great meaſure diſſipated in the proceſs juſt deſcribed, and that we cannot expect the ſame virtues in theſe ſubſtances after they are purified, which they poſſeſs in their crude ſtate. This proceſs is therefore contrary to the principles of good pharmacy: and ſuch ſpecimens of theſe gummy reſins as ſtand in need of it to give them an apparent degree of purity, ſhould not be admitted into the ſhop of the apothecary. Beſides, many of the impurities which they uſually contain, are eaſily ſeparated in compounding the preparations or extemporaneous preſcriptions into which they enter.

STYRAX PURIFICATA. *Lond. Dub.*
Purified Storax.

Diſſolve the ſtorax in rectified ſpirit of wine, and ſtrain the ſolution; afterwards reduce it to a proper thickneſs with a gentle heat.

Storax is a balſam or combination of reſin and benzoic acid, both of which are ſoluble in alcohol, and neither of them volatile in the heat neceſſary for evaporating alcohol. The proceſs for purifying it is therefore not liable to any chemical objections.

CHAP. XXXV.

POWDERS.

This form is proper for ſuch materials only as are capable of being ſufficiently dried to become pulveriſable, without the loſs of their virtue. There are ſeveral ſubſtances, however, of this kind, which cannot be conveniently taken in powder; bitter, acrid, fetid, drugs are too diſagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixed alkaline ſalts deliqueſce when ex-

pofed to the air; and volatile alkalies exhale. Many of the aromatics, too, fuffer a great lofs of their odorous principles when kept in powder; as in that form they expofe a much larger furface to the air.

The dofe of powders, in extemporaneous prefcription, is generally about half a drachm; it rarely exceeds a whole drachm: and is not often lefs than a fcruple. Subftances which produce powerful effects in fmall dofes are not exhibited in this form, unlefs their bulk be increafed by additions of lefs efficacy; thofe which require to be given in larger ones are better fitted for other forms.

The ufual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly thofe prepared from metallic fubftances, require a more confiftent vehicle, as fyrups; for from thin ones they foon fubfide: Refinous fubftances likewife are moft commodioufly taken in thick liquors; for in thin ones, they are apt to run into lumps, which are not eafily again foluble.

PULVIS ALOES CUM CANELLA. *Lond.*

Powder of Aloes with Canella.

Take of

Socoterine aloes, one pound;
White canella, three ounces.

Powder them feparately, and then mix them.

This was formerly well known by the title of Hiera Picra. The fpicy canella acts as a corrigent to the aloes, but the compound is more adapted to be formed into pills, than to be ufed in the ftate of powder.

PULVIS ALOETICUS CUM GUAIACO. *Lond.*

Aloetic powder with Guaiacum.

Take of

Socotorine aloes, one ounce and a half;
Gum guaiacum, one ounce;
Aromatic powder, half an ounce.

Rub the aloes and gum guaiacum feparately to powder; then mix them with the aromatic powder.

This powder is fuppofed to combine the fudorific effects of the guaiac with the purgative of the aloes.

PULVIS ALOETICUS CUM FERRO. *Lond.*

Aloetic Powder with Iron.

Take of
Socotorine aloes, an ounce and a half;
Myrrh, two ounces;
Dry extract of gentian,
Vitriolated iron, of each one ounce;
Reduce them feparately to powder, and mix them.

THIS combination is fufficiently judicious, as in fome cafes the combined effects of an aloetic and chalybeate prove of very great advantage. But powder is a bad form of exhibiting aloes; we would therefore recommend it to be formed into pills or bolufes, with a little mucilage.

PULVIS AROMATICUS. *Lond. Dub.*

Aromatic Powder.

Take of
Cinnamon, two ounces;
Smaller cardamom feeds, hufked;
Ginger,
Long pepper, of each one ounce.
Rub them together to a powder, (which is to be kept in a well corked phial, *Dub.*)

Edin.

Take of
Cinnamon,
Smaller cardamom feeds,
Ginger, each equal parts.
Reduce them to a very fine powder, which is to be kept in a glafs veffel well clofed.

BOTH of thefe compofitions are agreeable, hot, and fpicy, and may be ufefully taken in cold phlegmatic habits and decayed conftitutions, for warming the ftomach, promoting digeftion, and ftrengthening the tone of the vifcera. The dofe is from ten grains to a fcruple and upwards. The firft is confiderably the warmeft, from the quantity of long pepper which it contains.

Off. prep.—Pulvis aloët. cum guaiac, *Lond.* Elect. aromat. *Ed.* Elect. opiat. *Ed.*

PULVIS ASARI COMPOSITUS. *Lond. Dub.*

Compound Powder of Afarabacca.

Take of
Afarabacca,

Sweet marjoram,
Syrian herb-maſtich,
Lavender, of each, dried, one ounce.

Reduce them together to powder, which is to be kept in a cloſed phial.

Ed.

Take of
The leaves of aſarabacca, three parts.
———— marjoram,
Flowers of lavender, of each one part.

Rub them together to powder.

THEY are both agreeable and efficacious errhines, and ſuperior to moſt of thoſe uſually ſold under the name of *herb ſnuff*. They are often employed with great advantage in caſes of obſtinate headach, and of ophthalmias reſiſting other modes of cure. Taken under the form of ſnuff to the extent of five or ſix grains at bed-time, they will operate the ſucceeding day as a powerful errhine, inducing frequent ſneezing, and likewiſe a copious diſcharge from the noſe. It is, however, neceſſary, during their operation, to avoid expoſure to cold.

PULVIS CHELARUM CANCRI COMPOSITUS. *Lond.*

Compound Powder of Crabs Claws.

Take of
Crabs claws, prepared, one pound;
Chalk,
Red coral, each, prepared, three ounces.

Mix them.

THE invention of this formula muſt be aſcribed ſolely to the unphiloſophical idea, that the ſum of the powers of medicines was increaſed by mixing them together; for the preſent powder is a mixture of three varieties of carbonate of lime, which, notwithſtanding the immenſe differences of their prices, do not differ in their effects.

Off. prep.—Pulv. contrayerv. comp. *Lond.* Confectio aromat. *Lond.*

PULVIS CARBONATIS CALCIS COMPOSITUS; olim PULVIS CRETACEUS. *Edin.*

Compound Powder of Carbonate of Lime, formerly *Chalk Powder.*

Take of
Prepared carbonate of lime, four ounces;
Nutmeg, half a drachm;

Cinnamon, one drachm and a half.
Reduce them together to powder.

Pulvis Cretæ Compositus. *Lond.*
Compound Powder of Chalk.

Take of
Prepared chalk, half a pound;
Cinnamon, four ounces;
Tormentil,
Gum arabic, of each three ounces;
Long pepper, half an ounce.
Powder them ſeparately, and mix them.

The addition of the aromatics coincides with the general intention of the remedy, which is indicated in weakneſs and acidity in the ſtomach, and in looſeneſs from acidity.

PULVIS CRETÆ COMPOSITUS CUM OPIO. *Lond.*
Compound Powder of Chalk with Opium.

Take of
Compound powder of chalk, eight ounces;
Hard opium, powdered, one drachm and a half.
Mix them.

The addition of the opium renders this a more powerful remedy than the carbonate of lime alone, eſpecially where the diarrhœa proceeds from irritation of the inteſtinal canal.

PULVIS CERUSSÆ COMPOSITUS. *Lond.*
Compound Powder of Ceruſe.

Take of
Ceruſe, five ounces;
Sarcocoll, an ounce and a half;
Tragacanth, half an ounce.
Powder them together.

This is employed for external purpoſes, as in collyria, lotions, and injections for repelling acrimonious humours, and in inflammations; but for all theſe purpoſes it is very inferior to ſolutions of acetate of lead.

PULVIS CONTRAYERVÆ COMPOSITUS. *Lond.*
Compound Powder of Coutrayerva.

Take of
Contrayerva, powdered, five ounces;

Compound powder of crabs claws, one pound a half.
Mix them.

THIS medicine has a very good claim to the title of an alexipharmic and ſudorific. The contrayerva by itſelf proves very ſerviceable in low fevers, where the vis vitæ is weak, and a diaphoreſis to be promoted. It is poſſible, that the crabs claws are of no farther ſervice, than as they divide this active ingredient, and make it ſit more eaſily on the ſtomach.

PULVIS IPECACUANHÆ ET OPII. *Edin.* PULVIS IPECACUANHÆ COMPOSITUS; olim PULVIS DOVERI. *Lond. Dub.*
Powder of Ipecacuan and Opium, or *Compound Powder of Ipecacuan*, formerly *Dover's Powder*.

Take of
- Ipecacuan, in powder,
- Opium, (purified, *Dub.* hard purified, *Lond.*) of each one part;
- Sulphate of potaſs, eight parts.

Triturate them together into a fine powder.

THE ſulphate of potaſs, from the grittineſs of its cryſtals, is perhaps better fitted for tearing and dividing the tenacious opium than any other ſalt; this ſeems to be its only uſe in the preparation. The operator ought to be careful that the opium and ipecacuanha be equally diffuſed through the whole maſs of powder, otherwiſe different portions of the powder muſt have differences in degree of ſtrength.

This powder is one of the moſt certain ſudorifics, and as ſuch, was recommended by Dr. Dover, as an effectual remedy in rheumatiſm. Modern practice confirms its reputation, not only in rheumatiſm, but alſo in dropſy and ſeveral other diſeaſes, where it is often difficult by other means to produce a copious ſweat. The doſe is from five to twenty grains, according as the patient's ſtomach and ſtrength can bear it. It is proper to avoid much drinking immediately after taking it, otherwiſe it is very apt to be rejected by vomiting before any other effects are produced.

PULVIS JALAPÆ COMPOSITUS. *Edin.*
Compound Powder of Jalap.

Take of
- Jalap root, in powder one part;
- Super-tartrite of potaſs, two parts.

Grind them together to a very fine powder.

THE uſe of the cryſtals in this preparation, is to break down

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and divide the jalap; and therefore they are directed to be triturated together, and not ſeparately.

PULVIS MYRRHÆ COMPOSITUS. *Lond.*
Compound Powder of Myrrh.

Take of
  Myrrh,
  Dried ſavin,
  —— rue,
  Ruſſian caſtor, of each one ounce.
Rub them together into a powder.

This is a reformation of the Trochiſci Myrrhæ, a compoſition contrived by Rhazes againſt uterine obſtructions. From a ſcruple to a drachm, or more, two or three times a-day, may be taken in any convenient vehicle, or made into boluſes.

PULVIS OPIATUS. *Lond.*
Opiate Powder.

Take of
  Hard purified opium, powdered, one drachm;
  Burnt and prepared hartſhorn, nine drachms.
Mix them.

Edin.

Take of
  Opium, one part;
  Prepared carbonate of lime, nine parts.
Rub them together to a fine powder.

In theſe powders the opium is the active ingredient; and it is immaterial whether the phoſphate or carbonate of lime be uſed to promote its mechanical diviſion.

PULVIS SCAMMONII COMPOSITUS. *Lond.*
Compound Powder of Scammony.

Take of
  Scammony,
  Hard extract of jalap, of each two ounces;
  Ginger half an ounce.
Powder them ſeparately, and mix them.

Edin.

Take of
  Scammony,

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Super-tartrite of potafs, equal parts.
Rub them together to a very fine powder.

Dub.

Take of
Scammony,
Vitriolated vegetable alkali, each two ounces;
Ginger, half an ounce.
Powder them feparately and then mix them.

In the firft of thefe compofitions, the fcammony is combined with another purgative more active than itfelf, and in the others, with one much lefs fo; which difference muft be attended to in prefcription. The ginger is an ufeful addition, and will render it lefs apt to gripe.

PULVIS SCAMMONII COMPOSITUS CUM ALOE. *Lond.*

Compound Powder of Scammony with Aloes.

Take of
Scammony, fix drachms;
Hard extract of jalap,
Socotorine aloes, of each, an ounce and a half;
Ginger, half an ounce.
Powder them feparately, and mix them.

Here we have a combination of three powerful purgatives of the fame kind, but what advantage thefe compofitions have over the ingredients taken feparately, is not very apparent. Of the prefent, from five to ten grains is a fufficient dofe.

PULVIS SCAMMONII CUM CALOMELANE. *Lond.*

Powder of Scammony with Calomel.

Take of
Scammony, half an ounce;
Calomel,
Double refined fugar, of each two drachms.
Powder them feparately, and then mix them.

In this cafe the calomel may often be found to be an ufeful addition to the fcammony, as its mode of action is different, although it coincides with it in the general effect.

PULVIS SENNÆ COMPOSITUS. *Lond.*

Compound Powder of Senna.

Take of
Senna,

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Cryſtals of tartar, of each two ounces;
Scammony, half an ounce;
Ginger, two drachms.

Triturate the ſcammony by itſelf, reduce the reſt together into a powder, and then mix them all.

THIS powder is given as a cathartic, in the doſe of two ſcruples, or a drachm. The ſcammony is uſed as a ſtimulus to the ſenna; the quantity of the latter neceſſary for a doſe, when not aſſiſted by ſome more powerful material, being too bulky to be conveniently taken in this form. The ginger is added to make it ſit eaſier on the ſtomach and gripe leſs.

PULVIS SULPHATIS ALUMINÆ COMPOSITUS; olim PULVIS STYPTICUS. *Ed.*

Compound Powder of Sulphate of Alumina, formerly *Styptic Powder.*

Take of
Sulphate of alumina, four parts;
Kino, one part.

Rub them together to a fine powder.

THIS powder is compoſed of two very powerful aſtringents, but which we believe are not combined with propriety; at leaſt, it is certain that a ſolution of alum is decompoſed by a ſolution of kino.

PULVIS TRAGACANTHÆ COMPOSITUS. *Lond.*

Compound Powder of Tragacanth.

Take of
Tragacanth powdered,
Gum arabic,
Starch, of each an ounce and a half;
Double refined ſugar, three ounces.

Rub them together into a powder.

THIS compoſition is a mild emollient; and hence, becomes ſerviceable in hectic caſes, tickling coughs, ſtrangury, ſome kinds of alvine fluxes, and other diſorders proceeding from a thin acrimonious ſtate of the excreted fluids, or an abraſion of the mucus of the inteſtines; it is ſuppoſed to ſoften, and give a greater degree of conſiſtency to the former, and defend the latter from being irritated or excoriated by them. All the ingredients coincide in theſe general intentions. The doſe is from half a drachm to two or three drachms, which may be frequently repeated.

CHAP. XXXVI.

CONSERVES.

Conserves are compoſitions of recent vegetable matters and ſugar, beaten together into an uniform maſs.

This management is introduced for preſerving certain ſimples, undried, in an agreeable form, with as little alteration as poſſible in their native virtues; and in ſome caſes it is very advantageous. Vegetables, whoſe virtues are loſt or deſtroyed in drying, may in this form be kept uninjured for a conſiderable time; for by carefully ſecuring the mouth of the containing veſſel, the alteration, as well as diſſipation, of their active principles, is generally prevented; and the ſugar preſerves them from the corruption which juicy vegetables would otherwiſe undergo.

The ſugar ſhould be pounded by itſelf, and paſſed through a ſieve, before it be mixed with the vegetable maſs, for without this it cannot be properly incorporated. Roſe buds, and ſome other vegetables, are prepared for mixing with ſugar by a ſmall wooden mill contrived for that purpoſe.

There are, however, vagetables whoſe virtues are impaired by this treatment. Mucilaginous ſubſtances, by long lying with ſugar, become leſs glutinous; and aſtringents ſenſibly become ſofter upon the palate. Many of the fragrant flowers are of ſo tender and delicate a texture, as almoſt entirely to loſe their peculiar qualities on being beaten or bruiſed.

In general, it is obvious, that in this form, on account of the large proportion of ſugar, only ſubſtances of conſiderable activity can be taken with advantage as medicines. And, indeed, conſerves are at preſent conſidered chiefly as auxiliaries to medicines of greater efficacy, or as intermediums for joining them together. They are very convenient for reducing into boluſſes or pills the more ponderous powders, as ſubmuriate of mercury, the oxides of iron, and other mineral preparations; which, with liquid or leſs conſiſtent matters, as ſyrups, will not cohere.

The ſhops were formerly encumbered with many conſerves altogether inſignificant; the few now retained have in general either an agreeable flavour to recommend them, or are capable of anſwering ſome uſeful purpoſes as medicines. Their common doſe is the bulk of a nutmeg, or as much as can be taken up at once or twice upon the point of a knife. There is, in general, no great danger of exceeding in this particular.

CONSERVÆ

Conserves of

orticis exterioris recentis fructus CITRI AURANTII, *radula abrasi. Ed.*

Orange Peel, obtained by rasping off the outer rind of the fresh fruit.

AURANTII HISPALENSIS. *Lond.*

CORTICIS AURANTII. *Dub.*

Off. prep—Elect. aromat. *Dub.*

Fructus ROSÆ CANINÆ *maturi, a seminibus eorumque pube sollicite purgati. Ed.*

Hips, from the ripe fruit, after the seeds and down have been carefully picked out.

CYNOSBATI. *Lond.*

Petalorum ROSÆ GALLICÆ, *nondum explicitorum Ed.*

Red rose buds.

ROSÆ RUBRÆ. *Lond.*

ROSÆ. *Dub.*

Off. prep.—Pil. hydrarg. *Ed. Lond.*

ABSYNTHII MARITIMÆ. *Lond.* — Conserve of sea wormwood.

ACETOSELLÆ. *Dub.* — Conserve of wood sorrel.

LUJULÆ. *Lond.*

Pluck the leaves from the stalks, the unblown petals from the cups, cutting off the heels. Rasp off the outer rind of the oranges by a grater.

When prepared, beat them with a wooden pestle in a marble mortar, first by themselves, afterwards with three times their weight of double refined sugar, until they be mixed.

THE only exceptions to these general directions, which are those of the London college, are, that the London college adds only twenty ounces of sugar to one pound of the pulp of hips, and that the Dublin add only twice their weight of sugar to the sorrel leaves. La Grange says, that by infusing the red rose leaves in four times their weight of water, which is afterwards to be expressed from them, they lose their bitterness, and are more easily reduced to a pulp, which he then mixes with a thick syrup, prepared by dissolving the sugar in the expressed liquor, and boiling it down to the consistence of an electuary.

It is scarcely necessary to make any particular remarks on these conserves. Their taste and virtues are compounded of those of sugar, and the substance combined with it. The wood sorrel and hips are acidulous and refrigerant, the orange-rind and wormwood bitter and stomachic, and the red rose buds astringent.

CONSERVA ARI. *Lond.*

Conserve of Arum.

Take of

Fresh root of arum, bruised, half a pound;

Double refined ſugar, a pound and a half.
Beat them together in a mortar.

This is one of the beſt forms for exhibiting this ſimple, as its virtues are deſtroyed by drying, and are not extracted by any menſtruum. It may be given to adults in doſes of a drachm.

CONSERVA PRUNI SILVESTRIS. *Lond.*
Conſerve of Sloes.

Put the ſloes in water upon the fire, that they may ſoften, taking care that they be not broken; then take them out of the water, preſs out the pulp, and mix it with three times its weight of double refined ſugar into a conſerve.

This preparation is a gentle aſtringent, and may be given as ſuch in the doſe of two or three drachms.

CONSERVA SCILLÆ. *Lond.*
Conſerve of Squills.

Take of
Freſh ſquills, one ounce;
Double refined ſugar, five ounces.
Beat them together in a mortar into a conſerve.

This is a very uncertain and diſagreeable mode of exhibiting this valuable ſimple.

The London college conclude their chapter on conſerves with deſiring all the conſerves, eſpecially thoſe of arum and ſquills, to be kept in cloſe veſſels.

CHAP. XXXVII.

ELECTUARIES and CONFECTIONS.

Electuaries are compoſed chiefly of powders mixed up with ſyrups, &c. into ſuch a conſiſtence, that the powders may not ſeparate in keeping, that a doſe may be eaſily taken up on the point of a knife, and not prove too ſtiff to ſwallow.

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Electuaries are chiefly compoſed of the milder alterative medicines, and ſuch as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like (except in officinal electuaries to be diſpenſed by weight), are ſeldom exhibited in this form, on account of the uncertainty of the doſe: unpleaſant ones, acrids, bitters, fetids, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous ſubſtances, as mercurials, theſe being apt to ſubſide on keeping, unleſs the compoſition be made very ſtiff.

The lighter powders require thrice their weight of honey, or of ſyrup boiled to the thickneſs of honey, to make them into the conſiſtence of an electuary: of ſyrups of the common conſiſtence, twice the weight of the powder is ſufficient.

Where common ſyrups are employed, the compound is apt to candy and dry too ſoon: electuaries of Peruvian bark, for inſtance, made up with ſyrup alone, will often in a day or two grow too dry for taking. This is owing to the cryſtallization of the ſugar. Deyeux, therefore, adviſes electuaries, confections, and conſerves, to be made up with ſyrups from which all the cryſtallizable parts have been ſeparated. For this purpoſe, after being ſufficiently evaporated, they are to be expoſed to the heat of a ſtove as long as they form any cryſtals. The ſyrup which remains, probably from the preſence of ſome vegetable acid, has no tendency to cryſtallize, and is to be decanted and evaporated to a proper conſiſtence. In hoſpital practice, the ſame object may be obtained much more eaſily by uſing molaſſes inſtead of ſyrups, and in private practice, by the ſubſtitution of a little conſerve.

The quantity of an electuary directed at a time in extemporaneous preſcription varies much, according to its conſtituent parts; but is rarely leſs than the ſize of a nutmeg, or more than two or three ounces.

ELECTUARIUM AROMATICUM. *Ed.*

Aromatic Electuary.

Take of

Aromatic powder, one part;

Syrup of orange peel, two parts.

Mix and beat them well together, ſo as to form an electuary.

Dub.

Take of

Conſerve of orange-peel, three ounces;

Cinnamon,

Nutmeg, of each, in powder, half an ounce;

Ginger, in powder,

Saffron, of each two drachms;
Double refined fugar, one ounce;
Syrup of orange-peel, as much as may be neceffary to form the whole into an electuary, by beating them well together.

CONFECTIO AROMATICA. *Lond.*
Aromatic Confection.

Take of
Zedoary, in coarfe powder,
Saffron, of each half a pound;
Diftilled water, three pints.
Macerate for twenty-four hours; then prefs and ftrain. Reduce the ftrained liquor, by evaporation, to a pint and a half; to which add
Compound powder of crabs claws, fixteen ounces;
Cinnamon,
Nutmeg, of each two ounces;
Cloves, one ounce;
Smaller cardamom feeds, half an ounce;
Double refined fugar, two pounds.
Reduce the aromatics together to a very fine powder, and form them into a confection, by adding the fugar.

THESE compofitions are fufficiently grateful, and moderately warm. They are given in the form of a bolus, in dofes of from five grains to a fcruple, or upwards, as a cordial, or as a vehicle for more active fubftances. The fimple compofition of the Edinburgh college ferves all thefe purpofes as well as the complicated formula of the London college.

ELECTUARIUM CASSIÆ FISTULÆ. *Ed.*
Electuary of Caffia.

Take of
Pulp of caffia fiftularis, four parts;
Pulp of tamarinds,
Manna, each one part;
Syrup of pale rofes, four parts.
Having beat the manna in a mortar, diffolve it with a gentle heat in the fyrup; then add the pulps, and evaporate with a regularly continued heat to a proper confiftence.

ELECTUARIUM CASSIÆ. *Lond. Dub.*
Electuary of Caffia.

Take of
The frefh extracted pulp of caffia, half a pound;
Manna, two ounces;

Pulp of tamarinds, one ounce;
Rose syrup, half a pound.

Boil the manna, and dissolve it over a slow fire in the rose syrup; then add the pulps; and, with a continued heat, evaporate the whole to the proper thickness of an electuary.

These compositions are very convenient officinals, to serve as a basis for purgative electuaries, and other similar purposes. The tamarinds give them a pleasant acidity, and do not, as might be expected, dispose them to ferment. After standing for four months, the composition has been found no sourer than when first made. This electuary is usefully taken by itself, to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

ELECTUARIUM CASSIÆ SENNÆ; olim ELECTUARIUM LENITIVUM. *Ed.*

Electuary of Senna, commonly called *Lenitive Electuary*.

Take of
Senna, eight ounces;
Coriander seeds, four ounces;
Liquorice root bruised, three ounces;
Figs,
Pulp of prunes, each one pound;
——— tamarinds, half a pound;
Double refined sugar, two pounds and a half.

ELECTUARIUM SENNÆ. *Lond.*

Electuary of Senna.

Take of
Senna, eight ounces;
Coriander seeds, four ounces;
Liquorice, three ounces;
Figs, one pound;
Pulp of tamarinds,
—— cassia,
—— prunes, each half a pound.
Double refined sugar, two pounds and a half.

Powder the senna with the coriander seeds, and sift out ten ounces of the mixed powder; boil the remainder with the figs and liquorice, in four pounds of water to one half; express and strain the liquor, which is then to be evaporated, to the weight of about a pound and a half; dissolve the sugar in it; add this syrup by degrees to the pulps; and lastly, mix in the powder.

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Dub.

Take of
- Senna leaves, in very fine powder, four ounces;
- Pulp of French prunes, one pound;
- ——— tamarinds, two ounces;
- Molaſſes, a pound and a half;
- Eſſential oil of carraway, two drachms.

Boil the pulps in the ſyrup to the thickneſs of honey; then add the powders, and when the mixture is cooled, add the oil; then beat them all well together, ſo as to form an electuary.

This electuary is a very convenient laxative, and has long been in common uſe among practitioners. Taken to the ſize of a nutmeg or more, as occaſion may require, it is an excellent laxative for looſening the belly in coſtive habits. The formula of the Dublin college is much more ſimple and elegant than the other.

ELECTUARIUM MIMOSÆ CATECHU; olim Confectio Japonica. *Ed.*

Electuary of Catechu, commonly called *Japonic Confection.*

Take of
- Extract of mimoſa catechu, four ounces;
- Kino, three ounces;
- Cinnamon,
- Nutmeg, each one ounce;
- Opium, diffuſed in a ſufficient quantity of Spaniſh white wine, one drachm and a half;
- Syrup of red roſes, boiled to the conſiſtence of honey, two pounds and a quarter.

Reduce the ſolids to powder; and having mixed them with the opium and ſyrup, make them into an electuary.

Electuarium Catechu Compositum; olim Confectio Japonica. *Dub.*

Compound Electuary of Catechu, formerly *Japonic Confection.*

Take of
- Catechu, four ounces;
- Cinnamon,
- Nutmeg, each one ounce;
- Kino, three ounces;
- Purified opium, diffuſed in a ſufficient quantity of Spaniſh white wine, a drachm and a half;
- Syrup of ginger,
- Syrup of orange peel, of each, evaporated to the conſiſtence of honey, fourteen ounces;

Tincture of Tolu, two drachms.
Mix them, fo as to form an electuary.

These electuaries, which do not differ in any material particular, are extremely ufeful aftringent medicines, and are often given in dofes of a tea fpoonful, frequently repeated, in cafes of diarrhœa, &c. Ten fcruples contain one grain of opium.

ELECTUARIUM SCAMONII. *Lond. Dub.*
Electuary of Scammony.

Take of
Scammony, in powder, one ounce and a half;
Cloves,
Ginger, of each fix drachms;
Effential oil of caraway, half a drachm;
(Syrup of rofes, as much as is fufficient, *Lond.*) (fyrup of orange peel, *Dub.*)
Mix the fpices, powdered together with the fyrup; then add the fcammony, and laftly the oil of caraway.

This electuary is a warm brifk purgative. A drachm and a half contain fifteen grains of fcammony.

ELECTUARIUM OPIATUM; olim ELECTUARIUM THEBAICUM. *Edin.*
Opiate Electuary, commonly called *Thebaic Electuary.*

Take of
Aromatic powder, fix ounces;
Virginian fnake root, in fine powder, three ounces;
Opium, diffufed in a fufficient quantity of Spanifh white wine, half an ounce;
Syrup of ginger, one pound.
Mix them, and form an electuary.

CONFECTIO OPIATA. *Lond.*
Confection of Opium.

Take of
Hard purified opium, powdered, fix drachms;
Long pepper,
Ginger,
Caraway feeds, of each two ounces;
Syrup of white poppy, boiled to the confiftence of honey, three times the weight of the whole.
Mix the purified opium with the fyrup heated; then add the other ingredients rubbed to powder.

The action which these electuaries will produce on the living system, is abundantly apparent from the nature of their ingredients. They are combinations of aromatics with opium; one grain of opium being contained in thirty-six of the London confection, and in forty-three of the Edinburgh electuary.

CHAP. XXXVIII.

TROCHES.

Troches and lozenges are composed of powders made up with glutinous substances into little cakes, and afterwards dried. This form is principally made use of for the more commodious exhibition of certain medicines, by fitting them to dissolve slowly in the mouth, so as to pass by degrees into the stomach, or to act upon the pharynx and top of the trachea; and hence these preparations have generally a considerable proportion of sugar, or other materials grateful to the palate. Some powders have likewise been reduced into troches, with a view to their preservation; though possibly for no very good reasons; for the moistening, and afterwards drying them in the air, must rather tend to injure than to preserve them.

TROCHISCI CARBONATIS CALCIS. *Ed.*
Troches of Carbonate of Lime.

Take of
- Carbonate of lime, prepared, four ounces;
- Gum arabic, one ounce;
- Nutmeg, one drachm;
- Double refined sugar, six ounces.

Powder them together, and form them with water into a mass for making troches.

Trochisci Cretæ. *Lond.*
Troches of Chalk.

Take of
- Chalk, prepared, four ounces;
- Crabs claws, prepared, two ounces;
- Cinnamon, half an ounce;
- Double refined sugar, three ounces.

Powder them, and make them into troches with mucilage of gum arabic.

THESE are ufed againft acidity of the ftomach, efpecially when accompanied with diarrhœa.

TROCHISCI GLYCYRRHIZÆ GLABRÆ. *Ed.*
Troches of Liquorice.

Take of
Extract of liquorice,
Gum arabic, each one part;
White fugar, two parts.
Diffolve them in warm water, and ftrain: then evaporate the folution over a gentle fire till it be of a proper confiftence for being formed into troches.

TROCHISCI GLYCYRRHIZÆ. *Lond. Dub.*
Troches of Liquorice.

Take of
Extract of liquorice,
Double refined fugar, of each ten (fix *Dub.*) ounces;
Tragacanth, powdered, three (two *Dub.*) ounces.
Powder them thoroughly, and make them into troches with rofe water.

THESE are both agreeable pectorals, and may be ufed at pleafure in tickling coughs. The latter of thefe two receipts is the eafieft and beft mode of making thefe troches. Refined extract of liquorice fhould be ufed; and it is eafily powdered in the cold, after it has been laid for fome days in a dry and rather warm place. The folution and fubfequent evaporation directed by the Edinburgh college is exceedingly troublefome, and apt to give them an empyreumatic flavour.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *Ed.*
Liquorice Troches with Opium.

Take of
Opium, two drachms;
Tincture of Tolu, half an ounce;
Common fyrup, eight ounces;
Extract of liquorice, foftened in warm water,
Gum arabic, in powder, of each five ounces.
Triturate the opium well with the tincture, then add by degrees the fyrup and extract; afterwards gradually mix in the pow-

dered gum arabic. Lastly, dry them ſo as to form a maſs, to be divided into troches, each weighing ten grains.

Trochisci Glycyrrhizæ Compositi. *Dub.*
Compound Troches of Liquorice.

Take of
Purified opium, two drachms;
Balſam of Peru, one drachm;
Tincture of myrrh, three drachms.
Triturate the opium in the balſam and tincture mixed, until it be perfectly diſſolved; then gradually add of
Tincture of Tolu, two drachms;
Extract of liquorice, ſoftened in warm water, nine ounces.
Beat them together thoroughly, gradually adding of
Gum arabic, in powder, five ounces, and form the maſs into troches, weighing ten grains each.

These directions for preparing the above troches are ſo full and particular, that no further explanation is neceſſary. Six of the Dublin troches, and ſeven and a half of the Edinburgh, contain about one grain of opium. Theſe troches are medicines of approved efficacy in tickling coughs depending on an irritation of the fauces. Beſides the mechanical effect of the viſcid matters in involving acrid humours, or lining and defending the tender membranes, the opium no doubt muſt have a conſiderable ſhare, by more immediately diminiſhing the irritability of the parts themſelves.

TROCHISCI GUMMOSI. *Edin.*
Gum Troches.

Take of
Gum arabic, four parts;
Starch, one part;
Double refined ſugar, twelve parts.
Powder them, and make them into a proper maſs with roſe water, ſo as to form troches.

Trochisci Amyli. *Lond.*
Troches of Starch.

Take of
Starch, one ounce and a half;
Liquorice, ſix drachms;
Florentine orris, half an ounce;
Double refined ſugar, one pound and a half.
Powder them, and by means of mucilage of gum tragacanth, make troches. They may be alſo made without the orris.

THESE compositions are very agreeable pectorals, and may be used at pleasure. They are calculated for allaying the tickling in the throat which provokes coughing.

TROCHISCI MAGNESIÆ. *Lond.*
Troches of Magnesia.

Take of
Burnt magnesia, four ounces;
Double refined sugar, two ounces;
Ginger, powdered, one scruple.
Triturate them together, and, with the addition of the mucilage of gum arabic, make troches.

THESE are excellent antacids, and at the same time tend to keep the bowels open.

TROCHISCI NITRATIS POTASSÆ. *Ed.*
Troches of Nitrate of Potass.

Take of
Nitrate of potass, one part;
Double refined sugar, three parts.
Rub together to powder, and form them with mucilage of gum tragacanth into a mass, to be divided into troches.

TROCHISCI NITRI. *Lond.*
Troches of Nitre.

Take of
Purified nitre, powdered, four ounces;
Double refined sugar, powdered, one pound;
Tragacanth, powdered, six drachms.
With the addition of water, make troches.

THIS is a very agreeable form for the exhibition of nitre; though, when the salt is thus taken without any liquid, (if the quantity be considerable), it is apt to occasion uneasiness about the stomach, which can only be prevented by large dilution with aqueous liquors.

TROCHISCI SULPHURIS. *Lond.*
Troches of Sulphur.

Take of
Washed flowers of sulphur, two ounces;
Double refined sugar, four ounces.
Rub them together, with a sufficient quantity of the mucilage of quince seeds, and make troches.

This compoſition is to be conſidered only as an agreeable form for the exhibition of ſulphur, no alteration or addition being here made to its virtues.

CHAP. XXXIX.

PILLS.

To this form are peculiarly adapted thoſe drugs which operate in a ſmall doſe, and whoſe nauſeous and offenſive taſte or ſmell require them to be concealed from the palate.

Pills ſhould have the conſiſtence of a firm paſte, a round form, and a weight not exceeding five grains. Eſſential oils may enter them in ſmall quantity: deliqueſcent ſalts are improper. Efflo- reſcent ſalts, ſuch as carbonate of ſoda, ſhould be previouſly expoſed, ſo as to fall to powder: deliqueſcent extracts ſhould have ſome powder combined with them. The maſs ſhould be beaten until it become perfectly uniform and plaſtic. Powders may be made into pills with extracts, balſams, ſoap, mucilages, bread crumb, &c.

Gummy reſins, and inſpiſſated juices, are ſometimes ſoft enough to be made into pills, without addition: where any moiſture is requiſite, ſpirit of wine is more proper than ſyrups or conſerves, as it unites more readily with them, and does not ſenſibly increaſe their bulk. Light dry powders require ſyrup or mucilages: and the more ponderous, as the mercurial and other metallic preparations, thick honey, conſerve, or extracts.

Light powders require about half their weight of ſyrup; or of honey, about three fourths their weight; to reduce them into a due conſiſtence for forming pills. Half a drachm of the maſs will make five or ſix pills of a moderate ſize.

Gums and inſpiſſated juices, are to be firſt ſoftened with the liquid preſcribed; the powders are then to be added, and the whole beat thoroughly together, till they be perfectly mixed.

The maſſes for pills are beſt kept in bladders, which ſhould be moiſtened now and then with ſome of the ſame kind of liquid that the maſs was made up with, or with ſome proper aromatic oil.

When the maſs is to be divided into pills, a given weight of it is rolled out into a cylinder of a given length, and of an equal thickneſs throughout, and is then divided into a given number of equal pieces, by means of a ſimple machine. Theſe pieces are then rounded between the fingers; and, to prevent them from adhering, they are covered either with ſtarch, or powder of liquorice, or orris root. In Germany the powder of lycopodium is much uſed.

PILULÆ ALOETICÆ. *Ed.*
Aloetic Pills.

Take of
  Aloes, in powder,
  Soap, equal parts.
Beat them with ſimple ſyrup into a maſs fit for making pills.

Dub.

Take of
  Barbadoes aloes, in powder, one ounce;
  Extract of gentian, half an ounce;
  Ginger, in powder, two drachms;
Beat them together, and form a maſs with jelly of ſoap, (gelatina ſaponis.)

PILULÆ ALOES COMPOSITÆ. *Lond.*
Compound Pills of Aloes.

Take of
  Socotorine aloes, powdered, one ounce;
  Extract of gentian, half an ounce;
  Oil of caraway ſeeds, two ſcruples;
  Syrup of ginger, as much as is ſufficient.
Beat them together.

ALTHOUGH ſoap can ſcarcely be thought to facilitate the ſolution of the aloes in the ſtomach, as was ſuppoſed by Boerhaave and others, it is probably the moſt convenient ſubſtance that can be added to give it the proper conſiſtence for making pills. When extract of gentian is triturated with aloes, they re-act upon each other, and become too ſoft to form pills, ſo that the addition of any ſyrup to the maſs is perfectly unneceſſary, unleſs at the ſame time ſome powder be added to give it conſiſtency, as is done by the Dublin college. Theſe pills have been much uſed as warm and ſtomachic laxatives: they are very well ſuited for the coſtiveneſs ſo often attendant on people of ſedentary lives. Like other preparations of aloes, they are alſo uſed in jaundice, and in certain

cases of obstructed menses. They are seldom used for producing full purging; but if this be required, a scruple or half a drachm of the mass may be made into pills of a moderate size for one dose.

PILULÆ ALOES ET ASSÆ FŒTIDÆ. *Ed.*

Pills of Aloes and Assa Fœtida.

Take of

Socotorine aloes, in powder,
Assa fœtida,
Soap, equal parts.

Form them into a mass with mucilage of gum arabic.

THESE pills, in doses of about ten grains, twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

PILULÆ ALOES CUM COLOCYNTHIDE. *Ed.*

Pills of Aloes with Colocynth.

Take of

Socotorine aloes,
Scammony, of each eight parts;
Colocynth, four parts;
Oil of cloves,
Sulphate of potass with sulphur, of each one part.

Reduce the aloes and scammony into a powder with the salt; then let the colocynth, beat into a very fine powder, and the oil, be added; lastly, make it into a proper mass with mucilage of gum arabic.

THIS is more powerful in its operation than the simpler aloetic pills.

PILULÆ ALOES ET MYRRHÆ. *Ed.*

Take of

Socotorine aloes, four parts;
Myrrh, two parts;
Saffron, one part.

Beat them into a mass with simple syrup.

Lond.

Take of

Socotorine aloes, two ounces;
Myrrh,
Saffron, of each one ounce;
Syrup of saffron, as much as is sufficient.

Powder the aloes and myrrh separately; and afterwards beat all the ingredients together into a mass.

THESE pills have long continued in practice, without any other alteration than in the syrup with which the mass is made up, and in the proportion of saffron. The virtues of this medicine may be easily understood from its ingredients. Given to the quantity of half a drachm, or two scruples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives.

PILULÆ ASSÆ FŒTIDÆ COMPOSITÆ. *Ed.*
Compound Pills of Assa Fœtida.

Take of
Assa fœtida,
Galbanum,
Myrrh, each eight parts;
Rectified oil of amber, one part.
Beat them into a mass with simple syrup.

PILULÆ GALBANI COMPOSITÆ. *Lond.*
Compound Pills of Galbanum.

Take of
Galbanum,
Opopanax,
Myrrh,
Sagapenum, of each one ounce;
Assa fœtida, half an ounce;
Syrup of saffron, as much as is sufficient.
Beat them together.

THESE pills are designed for anti-hysterics and emmenagogues; and are very well calculated for answering those intentions; half a scruple, a scruple, or more, may be taken every night, or oftener.

PILULÆ AMMONIARETI CUPRI. *Ed.*
Pills of Ammoniaret of Copper.

Take of
Ammoniaret of copper, in fine powder, sixteen grains;
Bread crumb, four scruples;
Water of carbonate of ammonia, as much as may be sufficient.
Beat them into a mass, to be divided into thirty-two equal pills.

EACH of these pills weighs about three grains, and contains somewhat more than half a grain of the ammoniaret of copper. They seem to be the best form of exhibiting this medicine.

PILULÆ HYDRARGYRI. *Ed.*

Mercurial Pills.

Take of
Purified quickſilver,
Conſerve of red roſes, of each one ounce;
Starch, two ounces.

Triturate the quickſilver with the conſerve in a glaſs mortar, till the globules completely diſappear, adding occaſionally a little mucilage of gum arabic; then add the ſtarch, and beat the whole with a little water into a maſs, which is to be immediately divided into four hundred and eighty equal pills.

Lond.

Take of
Purified quickſilver, two drachms;
Conſerve of roſes, three drachms;
Liquorice, finely powdered, one drachm.

Rub the quickſilver with the conſerve until the globules diſappear; then, adding the liquorice powder, mix them together.

Dub.

Take of
Quickſilver,
Extract of liquorice, each three drachms;
Liquorice root, in fine powder, a drachm and a half;

Triturate the quickſilver with the extract of liquorice, reduced with warm water to the conſiſtence of honey, until its globules diſappear entirely; then add the powder of liquorice, and as much water as ſhall be ſufficient to form it into a maſs.

The common mercurial pill is one of the beſt preparations of mercury, and may, in general, ſuperſede moſt other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxide. To effect its mechanical diviſion, it muſt be triturated with ſome viſcid ſubſtance. Soap, reſin of guaiac, honey, extract of liquorice, manna, and conſerve of roſes, have all been at different times recommended. The ſoap and guaiac have been rejected on account of their being decompoſed by the juices of the ſtomach; and the honey, becauſe it was apt to gripe ſome people. With regard to the others, the grounds of ſelection are not well underſtood; perhaps the acid contained in the conſerve of roſes may contribute to the extinction of the mercury. We learn when the mercury is completely extinguiſhed, moſt eaſily, by rubbing a very little of the maſs with the point of

the finger on a piece of paper, if no globules appear. As ſoon as this is the caſe, it is neceſſary to mix with the maſs a proportion of ſome dry powder, to give it a proper degree of conſiſtency. For this purpoſe, powder of liquorice root has been commonly uſed, but it is extremely apt to become mouldy, and to cauſe the pills to ſpoil. The Edinburgh college have, therefore, with great propriety, ſubſtituted for it ſtarch, which is a very inalterable ſubſtance, and eaſily procured at all times in a ſtate of purity. It is neceſſary to form the maſs into pills immediately, as it ſoon becomes hard. One grain of mercury is contained in four grains of the Edinburgh maſs, in three of the London, and in two and a half of the Dublin. The doſe of theſe pills muſt be regulated by circumſtances; from two to ſix five-grain pills may be given daily.

PILULÆ OPII. *Lond.*
Pills of Opium.

Take of
- Hard purified opium, powdered, two drachms;
- Extract of liquorice, one ounce.

Beat them until they are perfectly united.

PILULÆ OPIATÆ; olim PILULÆ THEBAICÆ. *Ed.*
Opiate or *Thebaic Pills.*

Take of
- Opium, one part;
- Extract of liquorice, ſeven parts;
- Jamaica pepper, two parts.

Soften the opium, and extract ſeparately with diluted alcohol, and having beat them into a pulp, mix them: then add the pepper reduced to a powder; and laſtly, having beat them well together, form the whole into a maſs.

It is unfortunate that theſe two compoſitions ſhould differ ſo much in ſtrength, the former containing two, and the latter only one grain of opium, in ten of the maſs. Under the idea that opium is to operate as a ſedative, the addition of the pepper is ſomewhat injudicious. The London title alſo is ambiguous, as it is naturally employed for pills of opium without any addition.

PILULÆ RHEI COMPOSITÆ. *Ed.*
Compound Pills of Rhubarb.

Take of
- Rhubarb, in powder, one ounce;

Socotorine aloes, ſix drachms;
Myrrh, half an ounce;
Volatile oil of peppermint, half a drachm.
Make them into a maſs, with a ſufficient quantity of ſyrup of orange peel.

THIS pill is intended for moderately warming and ſtrengthening the ſtomach, and gently opening the belly. A ſcruple of the maſs may be taken twice a-day.

PILULÆ SCILLÆ. *Lond.* PILULÆ SCILLITICÆ. *Dub.*
Squill Pills.

Take of
Freſh dried ſquills, powdered, one drachm;
Ginger, powdered,
Soap, of each three drachms;
Ammoniacum, two drachms;
Syrup of ginger, as much as is ſufficient.
Beat them together, (and form a maſs with jelly of ſoap, *Dub.*)

PILULÆ SCILLITICÆ. *Edin.*
Squill Pills.

Take of
Dried root of ſquills, in fine powder, one ſcruple;
Gum ammoniac,
Leſſer cardamom ſeeds, in powder,
Extract of liquorice, each one drachm.
Form them into a maſs with ſimple ſyrup.

THESE are elegant and commodious forms for the exhibition of ſquills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtue of the compound is derived chiefly from the ſquills, the other ingredients are often varied in extemporaneous preſcription.

PILULÆ STIBII COMPOSITÆ; olim PILULÆ PLUMMERI. *Dub.*
Compound Antimonial Pills, formerly *Plummer's Pills.*

Take of
Precipitated ſulphur of antimony,
Mild muriate of mercury, each three drachms;
Extract of gentian,
Hard Spaniſh ſoap, each one drachm.
Let the mercury be triturated with the ſulphur; then add the extract, and form a maſs with jelly of ſoap.

THESE pills were recommended to the attention of the public about forty years ago, by Dr. Plummer, whoſe name they long bore. He repreſented them in a paper which he publiſhed in the Edinburgh medical eſſays as a very uſeful alterative; and on his authority they were at one time much employed; but they are now leſs extenſively uſed than formerly.

CHAP. XL.

CATAPLASMS.

CATAPLASMA ALUMINIS. *Lond.*
Cataplaſm of Alum.

COAGULUM ALUMINOSUM. *Dub.*
Alum Curd.

Take of
The white of two eggs, (any quantity, *Dub.*)
Shake them with a piece of alum till they be coagulated.

THIS preparation is taken from Riverius. It is an uſeful aſtringent epithem for ſore moiſt eyes. Where the complaint is violent, this preparation, after the inflammation has yielded a little to bleeding, is one of the beſt external remedies. It is to be ſpread on lint, and applied at bed-time.

CATAPLASMA CUMINI. *Lond.*
Cataplaſm of Cummin.

Take of
Cummin ſeed, one pound;
Bay berries,
Dry leaves of water germander, or ſcordium,
Virginian ſnake root, of each three ounces;
Cloves, one ounce.

Rub them all altogether to powder; and, with the addition of three times the weight of honey, make a cataplaſm.

This was intended as a reformation of the *Theriaca Londinenſis*, which for ſome time paſt has been ſcarcely otherwiſe uſed than as a warm cataplaſm. In place of the numerous articles which formerly entered that compoſition, only ſuch of its ingredients are retained as were ſuppoſed to contribute moſt to this intention.

CATAPLASMA SINAPEOS. *Lond.* Cataplasma Sinapium. *Dub.*

Muſtard Cataplaſm.

Take of
Muſtard ſeed, powdered,
Crumb of bread, of each half a pound;
Vinegar, as much as is ſufficient.
Mix, and make a cataplaſm.

Cataplasms of this kind are commonly known by the name of *Sinapiſms*. They were formerly frequently prepared in a more complicated ſtate, containing garlic, black ſoap, and other ſimilar articles; but the above ſimple form will anſwer every purpoſe which they are capable of accompliſhing. They are employed only as ſtimulants: they often inflame the part and raiſe bliſters, but not ſo perfectly as cantharides. They are frequently applied to the ſoles of the feet in the low ſtate of acute diſeaſes, for raiſing the pulſe and relieving the head. The chief advantage they have depends on the ſuddenneſs of their action.

CHAP. XLI.

LINIMENTS, OINTMENTS, CERATES, and PLASTERS.

These are all combinations of fixed oil, or animal fat, with other ſubſtances, and differ from each other only in conſiſtence.

Deyeux has, indeed, lately defined plasters to be combinations of oil with metallic oxides; but as this would comprehend many of our present ointments, and exclude many of our plasters, we shall adhere to the old meaning of the terms.

Liniments are the thinnest of these compositions, being only a little thicker than oil.

Ointments have generally a degree of consistence like that of butter.

Cerates are firmer, and contain a larger proportion of wax.

Plasters are the most solid, and when cold should be firm, and should not adhere to the fingers; but when gently heated, should become sufficiently soft to spread easily, and should then adhere to the skin. Plasters derive their firmness, either from a large proportion of wax, rosin, &c. or from the presence of some metallic oxide, such as that of lead.

Plasters should have such a consistence, that when cold they do not adhere to the fingers, but become soft and plastic when gently heated. The heat of the body should render it tenacious enough to adhere to the skin, and to the substance on which it is spread. When prepared, it is usually formed into rolls, and inclosed in paper. Plasters of a small size are often spread on leather, sometimes on strong paper, by means of a spatula gently heated, or the thumb. The leather is cut of the shape wanted, but somewhat larger; and the margin all round, about ¼ inch in breadth is left uncovered, for its more easy removal when necessary. Linen is also often used, especially for the less active plasters, which are used as dressings, and often renewed. It is generally cut into long slips of various breadths, from one to six inches. These may either be dipt into the melted plaster, and passed through two pieces of straight and smooth wood, held firmly together, so as to remove any excess of plaster; or, what is more elegant, they are spread on one side only, by stretching the linen, and applying the plaster, which has been melted and allowed to become almost cold, evenly by means of a spatula, gently heated, or, more accurately, by passing the linen on which the plaster has been laid, through a machine formed of a spatula fixed, by screws, at a proper distance from a plate of polished steel.

To prevent repetition, the Edinburgh college give the following canon for the preparation of these substances.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding, at the same time, the dry ingredients, if there be any, until the mixture, on cooling, becomes stiff. (*Ed.*)

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ADIPIS SUILLÆ, SEVIQUE OVILLI, PRÆPARATIO.
Lond.

The Preparation of Hog's Lard and Mutton Suet.

Cut them into pieces, and melt them over a ſlow fire; then ſeparate them from the membranes by ſtraining.

Before proceeding to melt theſe fats, it is better to ſeparate as much of the membranes as poſſible, and to waſh them in repeated quantities of water until they no longer give out any colour. Over the fire they will be perfectly tranſparent, and if they do not crackle on throwing a few drops into the fire, it is a ſign that all the water is evaporated, and that the fats are ready for ſtraining, which ſhould be done through a linen cloth without expreſſion. The reſiduum may be repeatedly melted with a little water, until it become diſcoloured with the fire. The fluid fat ſhould be poured into the veſſels, or bladders, in which it is to be preſerved.

Theſe articles had formerly a place alſo among the preparations of the Edinburgh college. But now they introduce them only into their liſt of the materia medica; as the apothecary will in general find it more for his intereſt to purchaſe them thus prepared, than to prepare them for himſelf; for the proceſs requires to be very cautiouſly conducted, to prevent the fat from burning or turning black.

LINIMENTUM SIMPLEX. *Ed.*
Simple Liniment.

Take of
- Olive oil, four parts;
- White wax, one part.

This conſiſts of the ſame articles which form the Unguentum ſimplex of the Edinburgh pharmacopœia, but merely in a different proportion, ſo as to render the compoſition thinner; and where a thin conſiſtence is requiſite, this may be conſidered as a very elegant and uſeful application.

Off. prep.—Ungt. oxidi zinci impuri, *Ed.* Ungt. oxidi zinci, *Ed.*

UNGUENTUM APIDIS SUILLÆ. *Lond.*
Ointment of Hog's Lard.

Take of
- Prepared hog's lard, two pounds;
- Roſe water, three ounces.

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Beat the lard with the rofe water until they be mixed; then melt the mixture with a flow fire, and fet it apart that the water may fubfide, after which, pour off the lard from the water, conftantly ftirring it until it be cold.

Off. prep.—Ungt. helleb. albi, *Lond.* Ungt. fulph. *Lond. Dub.* Ungt. calcis hydrarg. albi, *Lond.* Ungt. tutiæ, *Dub.*

UNGUENTUM SIMPLEX. *Ed.*

Simple Ointment.

Take of
Olive oil, five parts;
White wax, two parts.

Off. prep.—Ungt. oxidi plumbi albi, *Ed.* Ungt. acet plumbi, *Ed.*

Both thefe ointments may be ufed for foftening the fkin and healing chaps. The laft is, however, preferable, as being more fteadily of one uniform confiftence. For the fame reafon it is alfo to be preferred as the bafis of other more compounded ointments.

UNGUENTUM SPERMATIS CETI. *Lond. Dub.*

Ointment of Spermaceti.

Take of
Spermaceti, fix drachms;
White wax, two drachms;
Olive oil, three ounces.

Melt them together over a flow fire, ftirring them conftantly and brifkly until they be cold.

This had formerly the name of *Linimentum album*, and it is perhaps only in confiftence that it can be confidered as differing from the unguentum fimplex, already mentioned, or the ceratum fimplex, afterwards to be taken notice of.

Off. prep.—Ungt. tutiæ, *Lond.*

UNGUENTUM CERÆ. *Lond. Dub.*

Wax Ointment.

Take of
White wax, four ounces;
Spermaceti, three ounces;
Olive oil, one pint, (fourteen ounces, *Dub.*)

Stir them, after being melted with a flow fire, conftantly and brifkly, until cold.

This ointment had formerly the title of *Unguentum album* in the London pharmacopœia. It differs very little from the Unguentum ſimplex of the Edinburgh pharmacopœa, and in nothing from the Unguentum ſpermatis ceti of the other pharmacopœias, excepting that in this ointment the proportion of wax is four times greater. It is an uſeful cooling ointment for excoriations and other frettings of the ſkin.

Off. prep.—Cerat. carb. zinci impuri, *Ed.*

CERATUM SIMPLEX. *Ed.*

Simple Cerate.

Take of
- Olive oil, ſix parts;
- White wax, three parts;
- Spermaceti, one part.

Off. prep.—Cerat cantharidis, *Lond. Dub.*

CERATUM SPERMATIS CETI. *Lond. Dub.*

Cerate of Spermaceti.

Take of
- Spermaceti, half an ounce;
- White wax, two ounces;
- Olive oil, four ounces.

Melt them together, and ſtir until the cerate be cold.

This had formerly the name of *Ceratum album*, and it differs in nothing from the Unguentum ſpermatis ceti, or Linimentum album, as it was formerly called, excepting in conſiſtence, both the wax and the ſpermaceti bearing a greater proportion to the oil.

UNGUENTUM RESINÆ FLAVÆ. *Lond. Dub.*

Ointment of Yellow Reſin.

Take of
- Yellow reſin,
- Yellow wax, of each one pound;
- Olive oil, one pint, (ſeven ounces, *Dub.*)

Melt the reſin and wax with a ſlow fire; then add the oil and ſtrain the mixture while hot.

UNGUENTUM RESINOSUM. *Ed.*

Reſinous Ointment.

Take of
- Hog's lard, eight parts;

White reſin, five parts;
Yellow wax, two parts.

THESE are commonly employed in dreſſings, for digeſting, cleanſing, and incarnating, wounds and ulcers.

Off. prep.—Cerat. reſin. flav. *Lond. Dub.* Ungt. canth. *Lond. Dub.* Ungt. pulv. mel. veſic, *Ed.* Ungt. ſub-acet. cupri, *Ed.*

CERATUM RESINÆ FLAVÆ. *Lond. Dub.*
Cerate of Yellow Reſin.

Take of
Ointment of yellow reſin, half a pound;
Yellow wax, one ounce.
Melt them together, and make a cerate.

THIS had formerly the name of *Unguentum citrinum.* It is no otherwiſe different from the Yellow baſilicum, or Unguentum reſinæ flavæ, than being of a ſtiffer conſiſtence, which renders it for ſome purpoſes more commodious.

EMPLASTRUM CERÆ. *Dub.* EMPLASTRUM CERÆ COMPOSITUM. *Lond.*
Compound Wax Plaſter.

Take of
Yellow wax,
Prepared mutton ſuet, of each three pounds;
Yellow reſin, one pound.
Melt them together, and ſtrain the mixture while it is fluid.

EMPLASTRUM SIMPLEX, OLIM EMPLASTRUM CEREUM. *Edin.*
Simple or *Wax Plaſter.*

Take of
Yellow wax, three parts;
Mutton ſuet,
White reſin, each two parts.

THIS is chiefly uſed to ſupport the diſcharge from a part which has been bliſtered, and was therefore formerly called *Emplaſtrum attrahens.* Sometimes, however, it irritates too much on account of the reſin; and hence, when deſigned only for dreſſing bliſters, the reſin ought to be entirely omitted, unleſs where a continuance of the pain and irritation, excited by the veſicatory, is required. Indeed, plaſters of any kind are not very proper for

dreſſing bliſters; their conſiſtence makes them ſit uneaſy, and their adheſiveneſs renders the taking them off painful. Cerates, which are ſofter and leſs adheſive, appear much more eligible: the Ceratum ſpermatis ceti will ſerve for general uſe; and for ſome particular purpoſes, the Ceratum reſinæ flavæ may be applied.

Off. prep.—Empl. canth. *Lond. Dub.*

UNGUENTUM ELEMI. *Dub.* UNGUENTUM ELEMI COMPOSITUM. *Lond.*

Compound Ointment of Elemi.

Take of
- Elemi, one pound;
- Turpentine, ten ounces;
- Mutton ſuet, prepared, two pounds;
- Olive oil, two ounces.

Melt the elemi with the ſuet; and having removed it from the fire, mix it immediately with the turpentine and oil; after which ſtrain the mixture.

THIS ointment, formerly known by the name of *Linimentum Arcæi*, has long been uſed for digeſting, cleanſing, and incarnating; and for theſe purpoſes is preferred by ſome ſurgeons to all the other compoſitions of this kind, probably becauſe it is more expenſive.

UNGUENTUM PICIS. *Lond. Dub.*

Tar Ointment.

Take of
- Tar,
- Mutton ſuet, prepared, of each half a pound.

Melt them together, and ſtrain.

Edin.

Take of
- Tar, five parts;
- Yellow wax, two parts.

THESE compoſitions cannot be conſidered as differing eſſentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatic oil and ſaline matters which it contains, it is undoubtedly of ſome activity. Accordingly, it has been ſucceſsfully employed againſt ſome cutaneous affections, particularly tinea capitis.

EMPLASTRUM PICIS BURGUNDICÆ. *Dub.* EMPLASTRUM PICIS COMPOSITUM. *Lond.*

Compound Burgundy Pitch Plaſter.

Take of
- Burgundy pitch, two pounds;
- Ladanum, (Galbanum, *Dub.*) one pound;
- Yellow reſin,
- Yellow wax, of each four ounces;
- Expreſſed oil of mace, one ounce.

To the pitch, reſin, and wax, melted together, add firſt the ladanum, (galbanum, *Dub.*) and then the oil of mace.

EMPLASTRUM CUMINI. *Lond.*

Cummin Plaſter.

Take of
- Cummin ſeeds,
- Caraway ſeeds,
- Bay berries, of each three ounces;
- Burgundy pitch, three pounds;
- Yellow wax, three ounces.

Melt the pitch and wax together, and mix with them the reſt of the ingredients, powdered, and make a plaſter.

THIS plaſter has been recommended as a moderately warm diſcutient; and is directed by ſome to be applied to the hypogaſtric region, for ſtrengthening the viſcera, and expelling flatulencies.

EMPLASTRUM LADANI COMPOSITUM. *Lond.*

Compound Ladanum Plaſter.

Take of
- Ladanum, three ounces;
- Frankincenſe, one ounce;
- Cinnamon, powdered,
- Expreſſed oil of mace, of each half an ounce:
- Eſſential oil of mint, one drachm.

To the melted frankincenſe, add firſt the ladanum, ſoftened by heat; then the oil of mace. Mix theſe afterwards with the cinnamon and oil of mint, and beat them together, in a warm mortar, into a plaſter. Let it be kept in a cloſe veſſel.

THIS has been conſidered as a very elegant ſtomach plaſter. It is contrived ſo as to be eaſily made occaſionally, (for theſe kinds

of compoſitions, on account of their volatile ingredients, are not fit for keeping), and to be but moderately adheſive, ſo as not to offend the ſkin, and that it may, without difficulty, be frequently renewed; which theſe ſorts of applications, in order to their producing any conſiderable effect, require to be.

UNGUENTUM SAMBUCI. *Lond.* UNGUENTUM SAMBUCINUM. *Dub.*

Elder Ointment.

Take of
Elder flowers, four pounds;
Mutton ſuet, prepared, three pounds;
Olive oil, one pint.

Boil the flowers in the ſuet and oil, till they be almoſt criſp; then ſtrain with expreſſion.

COMPOSITIONS of this kind were formerly very frequent; but vegetables, by boiling in oils, impart to them nothing but a little mucilage, which changes the greaſy oils to drying oils, and any reſin they may contain; but that alſo is never in ſuch quantity as to affect the nature of the oil. We, therefore, do not ſuppoſe that this ointment poſſeſſes any properties different from a ſimple ointment of the ſame conſiſtence.

UNGUENTUM CANTHARIDIS. *Lond.* UNGUENTUM CANTHARIDUM. *Dub.*

Ointment of Spaniſh Flies.

Take of
Spaniſh flies, powdered, two ounces;
Diſtilled water, eight ounces, (water, nine ounces, *Dub.*)
Ointment of yellow reſin, eight ounces.

Boil the water with the Spaniſh flies to one half, and ſtrain. To the ſtrained liquor add the ointment of yellow reſin. Evaporate this mixture to the thickneſs of an ointment in a water-bath, ſaturated with ſea-ſalt.

UNGUENTUM INFUSI MELOES VESICATORII; vulgo UNGUENTUM EPISPASTICUM MITIUS. *Ed.*

Ointment of Infuſion of Cantharides, commonly called *Mild or Epiſpaſtic Ointment.*

Take of
Cantharides,
White reſin,
Yellow wax, each one part;

Hog's lard,
Venice turpentine, each two parts;
Boiling water, four parts.

Macerate the cantharides in the water for a night; then ftrongly prefs out and ftrain the liquor, and boil it with the lard till the water be confumed; then add the refin and wax; and when thefe are melted, take the ointment off the fire and add the turpentine.

THESE ointments, containing the foluble parts of the cantharides, uniformly blended with the other ingredients, are more commodious, and in general occafion lefs pain, though little lefs effectual in their action, than the compofitions with the fly in fubftance. A very good ftimulating liniment is compofed by melting one part of this with half a part of camphor in powder, and three parts of turpentine.

UNGUENTUM PULVERIS MELOES VESICATORII;
olim UNGUENTUM EPISPASTICUM FORTIUS. *Edin.*
Ointment of the Powder of Spanifh Flies, formerly *Stronger Epifpaftic Ointment*.

Take of
Refinous ointment, feven parts;
Powdered cantharides, one part.

THIS ointment is employed in the dreffings for blifters, intended to be made *perpetual*, as they are called, or to be kept running for a confiderable time, which, in many chronic, and fome acute cafes, is of great fervice. Particular care fhould be taken, that the cantharides employed in thefe compofitions be reduced into very fubtile powder, and that the mixtures be made as equal and uniform as poffible.

CERATUM CANTHARIDIS. *Lond. Dub.*
Cerate of Cantharides.

Take of
Cerate of fpermaceti, foftened with heat, fix drachms, (one ounce, *Dub.*)
Spanifh flies, finely powdered, one drachm, (four fcruples, *Dub.*)
Mix them.

THIS is alfo an iffue ointment, of a confiderably firmer confiftency than either of the former.

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EMPLASTRUM CANTHARIDIS. *Lond. Dub.*

Plaster of Spanish Flies.

Take of

Spanish flies, finely powdered, one pound;
Wax plaster, two pounds;
Prepared hog's lard, half a pound.

Having melted the plaster and lard, sprinkle and mix in the flies, a little before they become firm.

EMPLASTRUM MELOES VESICATORII; olim EMPLASTRUM VESICATORIUM. *Ed.*

Plaster of Spanish Flies, formerly *Blistering Plaster.*

Take of

Mutton suet,
Yellow wax,
White resin,
Cantharides, each equal weights.

Mix the cantharides, reduced to a fine powder, with the other ingredients, previously melted, and removed from the fire.

In making these plasters, from an incautious application of heat, the cantharides sometimes lose their vesicating powers; therefore it is customary, after the blister is spread, to cover its surface with powdered cantharides. The effect is also more speedy and certain, if the part to which it is to be applied be well bathed with hot vinegar; and it is more easily removed if a bit of thin gauze be interposed between it and the skin.

EMPLASTRUM MELOES VESICATORII COMPOSITUM. *Edin.*

Compound Plaster of Spanish Flies.

Take of

Burgundy pitch,
Venice turpentine,
Cantharides, each twelve parts;
Yellow wax, four parts;
Sub-acetite of copper, two parts;
Mustard seed,
Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these, in fusion, and still hot, add the other ingredients, reduced to a fine powder, and mixed, and stir the whole carefully together, so as to form a plaster.

This is ſuppoſed to be the moſt infallible bliſtering plaſter. It certainly contains a ſufficient variety of ſtimulating ingredients.

UNGUENTUM HELLEBORI ALBI. *Lond. Dub.*
Ointment of White Hellebore.

Take of
White hellebore, one ounce;
Ointment of hog's lard, (hog's lard, *Dub.*) four ounces;
Eſſence of lemon, half a ſcruple.
Mix, and make them into an ointment.

This is recommended in the itch, and other cutaneous affections.

UNGUENTUM SULPHURIS. *Lond. Dub.*
Sulphur Ointment.

Take of
Ointment of hog's lard, half a pound, (five ounces, *Dub.*)
Flowers of ſulphur, four (three, *Dub.*) ounces.
Mix them, and make an ointment.

Edin.

Take of
Hog's lard, four parts;
Sublimed ſulphur, one part.
To each pound of this ointment add,
Volatile oil of lemons, or
———— of lavender, half a drachm.

Sulphur is a certain remedy for the itch, more ſafe than mercury. A pound of ointment ſerves for four unctions. The patient is to be rubbed every night, a fourth part of the body at each time. Though the diſeaſe may be thus cured by a ſingle application, it is in general adviſable to touch the parts moſt affected for a few nights longer, and to conjoin with the frictions the internal uſe of ſulphur.

UNGUENTUM ACIDI NITROSI. *Ed.*
Ointment of Nitrous Acid.

Take of
Hog's lard, one pound;
Nitrous acid, ſix drachms.

Mix the acid gradually with the melted axunge, and diligently beat the mixture as it cools.

The axunge in this ointment ſeems to be oxidized; for during the action of the acid upon it, there is a great deal of nitric oxide gas diſengaged. It acquires a yellowiſh colour, and a firm conſiſtency; and forms an excellent and cheap ſubſtitute, in ſlight herpetic and other cutaneous affections, for the ointment of nitrate of mercury.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI; olim EMPLASTRUM COMMUNE. *Ed.*

Plaſter of the Semi-vitrified Oxide of Lead, formerly *Common Plaſter.*

Take of

Semi-vitrified oxide of lead, one part;

Olive oil, two parts.

Boil them, adding water, and conſtantly ſtirring the mixture till the oil and litharge be formed into a plaſter.

EMPLASTRUM LITHARGYRI. *Lond. Dub.*

Litharge Plaſter.

Take of

Litharge, in very fine powder, five pounds;

Olive oil, a gallon, (nine pounds, *Dub.*)

Water, two pints, (two pounds, *Dub.*)

Boil them with a ſlow fire, conſtantly ſtirring until the oil and litharge unite, ſo as to form a plaſter. (But it will be proper to add more boiling water, if the water that was firſt added be nearly conſumed before the end of the proceſs. *Lond.*)

OXIDES of lead, boilied with oils, unite with them into a plaſter of an excellent conſiſtence, and forming a proper baſis for ſeveral other plaſters.

In the boiling of theſe compoſitions, a quantity of water muſt be added, to prevent the plaſter from burning and growing black. Such water as it may be neceſſary to add during the boiling, muſt be previouſly made hot; for cold liquor would not only prolong the proceſs, but likewiſe occaſion the matter to explode, and be thrown about with violence, to the great danger of the operator: this accident will equally happen upon the addition of hot water, if the plaſter be extremely hot. It is therefore better to remove it from the fire a little before each addition of water.

These plasters, which have been long known under the name of Diachylon, are common applications in excoriations of the skin, slight flesh wounds, and the like. They keep the part soft and somewhat warm, and defend it from the air, which is all that can be expected in these cases from any plaster.

Off. prep.—Emp. oxidi ferri rubri, *Ed.* Emplast. hydrarg. *Ed.* Emp. thuris comp. *Ed.* Emplast. sap. *Ed. Lond. Dub.* Emplast. lith. comp. *Lond.* Emp. gum. *Ed.* Emp. assæ fœtid. *Ed.* Emp. lith. cum resina, *Lond.* Emplast. resin. *Ed.* Empl. lith. cum. hydrarg. *Lond.*

EMPLASTRUM RESINOSUM; vulgo EMPLASTRUM ADHÆSIVUM. *Ed.*

Resinous Plaster, commonly called *Adhesive Plaster*.

Take of
Plaster of semi-vitrified oxide of lead, five parts;
White resin, one part.

EMPLASTRUM LITHARGYRI CUM RESINA. *Lond.*

Litharge Plaster with Resin.

Take of
Litharge plaster, three pounds;
Yellow resin, half a pound.
To the litharge plaster, melted with a very slow fire, add the powdered resin; mix them well, and make a plaster.

THESE plasters are used as adhesives for keeping on other dressings; for retaining the edges of recent wounds together, when we are endeavouring to cure them by the first intention, and especially for giving mechanical support to new flesh; and contracting the size of ulcers, in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs, a mode of treatment so efficacious, that it has entirely changed the character of these sores.

EMPLASTRUM ASSÆ FOETIDÆ. *Ed.*

Plaster of Assa Fœtida.

Take of
Plaster of semi-vitrified oxide of lead,
Assa fœtida, each two parts;
Galbanum,
Yellow wax, each one part.

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This plaster is applied to the umbilical region, or over the whole abdomen, in hysteric cases; and sometimes with good effect.

EMPLASTRUM GUMMOSUM. *Edin.*
Gum Plaster.

Take of
Plaster of semi-vitrified oxide of lead, eight parts;
Gum ammoniacum,
Galbanum,
Yellow wax, each one part.

Off. prep.—Emplast. sapon. *Ed.*

EMPLASTRUM LITHARGYRI COMPOSITUM. *Lond.*
Compound Plaster of Litharge.

Take of
Litharge plaster, three pounds;
Strained galbanum, eight ounces;
Turpentine, ten drachms;
Frankincense, three ounces.
The galbanum and turpentine being melted, mix with them the powdered frankincense, and afterwards the litharge plaster, melted also with very slow fire, and make a plaster.

Both these plasters are used as digestives and suppuratives; particularly in abscesses, after a part of the matter has been maturated and discharged, for suppurating or discussing the induration which remains.

CERATUM SAPONIS. *Lond. Dub.*
Soap Cerate.

Take of
Soap, (hard Spanish soap, *Dub.*) eight ounces;
Yellow wax, ten ounces;
Litharge, powdered, one pound;
Olive oil, one pint, (fourteen ounces, *Dub.*)
Vinegar, one gallon, (eight pounds, *Dub.*)
Boil the vinegar with the litharge, over a slow fire, constantly stirring, until the mixture unites and thickens; then mix in the other articles, and make a cerate.

This acts in reality as a ſaturnine application, the ſoap having only the effect of giving a very convenient degree of adheſiveneſs.

EMPLASTRUM SAPONIS. *Lond.* EMPLASTRUM SAPONACEUM. *Dub.*
Soap Plaſter.

Take of
Soap, one part;
Litharge plaſter, ſix parts.
Mix the ſoap with the melted litharge plaſter, and boil them to the thickneſs of a plaſter.

EMPLASTRUM SAPONACEUM. *Ed.*
Saponaceous Plaſter.

Take of
Plaſter of ſemi-vitrified oxide of lead, four parts;
Gum plaſter, two parts;
Soap ſliced, one part.
To the plaſters, melted together, add the ſoap; then boil for a little, ſo as to form a plaſter.

These are ſuppoſed to be mild diſcutients.

EMPLASTRUM THURIS COMPOSITUM. *Lond.*
Compound Frankincenſe Plaſter.

Take of
Frankincenſe, half a pound;
Dragons blood, three ounces;
Litharge plaſter, two pounds.
To the melted litharge plaſter add the reſins in powder.

It has been erroneouſly ſuppoſed that plaſters compoſed of ſtyptic medicines ſtrengthen the part to which they are applied; for plaſters in general relax, rather than aſtringe; and indeed the preſent example of theſe ſuppoſed aſtringent plaſters i merely a reſinous plaſter made with expenſive ingredients.

UNGUENTUM OXIDI PLUMBI ALBI; vulgo UNGUENTUM ALBUM. *Ed.*
Ointment of White Oxide of Lead, formerly *White Ointment.*

Take of
Simple ointment, five parts;

White oxide of lead, one part.

This is a cooling deficcative ointment, of great ufe when applied to excoriated furfaces.

UNGUENTUM ACETITIS PLUMBI; vulgo Unguentum Saturninum. *Ed.*

Ointment of Acetite of Lead, formerly *Saturnine Ointment.*

Take of

Simple ointment, twenty parts;
Acetite of lead, one part.

UNGUENTUM CERUSSÆ ACETATÆ. *Lond. Dub.*

Ointment of Acetated Cerufe.

Take of

Acetated cerufe, two drachms;
White wax, two ounces;
Olive oil, half a pint, (half a pound, *Dub.*)

Rub the acetated cerufe, previoufly powdered, with fome part of the olive oil; then add it to the wax, melted with the remaining oil. Stir the mixture until it be cold.

These are alfo excellent cooling ointments, of the greateft ufe in many cafes.

CERATUM LITHARGYRI ACETATI COMPOSITUM. *Lond.* Ceratum Lithargyri Acetati. *Dub.*

Compound Cerate of Acetated Litharge.

Take of

Water of acetated litharge, two ounces and a half;
Yellow wax, four ounces;
Olive oil, nine ounces;
Camphor, half a drachm.

Rub the camphor with a little of the oil, melt the wax with the remaining oil; and as foon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and ftir conftantly until it be cold; then mix in the camphor previoufly rubbed with oil.

This compofition was much recommended by M. Goulard. It differs from the other faturnine ointments only in confiftence.

UNGUENTUM HYDRARGYRI; vulgo UNGUENTUM COERULEUM. *Ed.*

Ointment of Quickſilver, commonly called *Blue Ointment.*

Take of
 Quickſilver,
 Mutton ſuet, each one part;
 Hog's lard, three parts.

Rub the mercury carefully in a mortar with a little of the hog's lard till the globules entirely diſappear, then add the reſt of the fats.

This ointment may alſo be made with double or treble the quantity of quickſilver.

UNGUENTUM HYDRARGYRI FORTIUS. *Lond. Dub.*

Stronger Mercurial Ointment.

Take of
 Purified quickſilver, two pounds;
 Prepared hog's lard, twenty-three ounces;
 Prepared mutton ſuet, one ounce;

Firſt triturate the quickſilver with the ſuet and a little of the hog's lard until the globules be extinguiſhed; then add the reſt of the lard, and form it into an ointment.

UNGUENTUM HYDRARGYRI MITIUS. *Lond. Dub.*

Milder Mercurial Ointment.

Take of
 The ſtronger ointment of quickſilver, one part;
 Hog's lard, prepared, two parts.

Mix them.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ed.*

Ointment of Grey Oxide of Quickſilver.

Take of
 Grey oxide of quickſilver, one part;
 Hog's lord, three parts.

THESE ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active ſtate into the circulating ſyſtem; which may be effected by gentle friction on the ſound ſkin of any part, particularly on the inſide of the thighs or legs. For this purpoſe, theſe ſimple ointments are much better ſuited than the more compounded ones with turpentine and the like, formerly employed; for by any acrid ſubſtance topical inflammation is apt to be ex-

cited, preventing further friction, and giving much uneasiness. To avoid this, it is necessary, even with the mildest and weakest ointment, to change occasionally the place at which the friction is performed.

It is requisite that the ointments in which the mercury is extinguished by trituration should be prepared with very great care; for upon the degree of triture which has been employed, the activity of the mercury very much depends. The addition of the mutton suet, now adopted by both colleges, is an advantage to the ointment, as it prevents it from running into the state of oil, which the hog's lard alone, in warm weather, or in a warm chamber, it is sometimes apt to do, and which is followed by a separation of parts. We are even inclined to think, that the proportion of suet directed by the London college is too small for this purpose, and indeed seems to be principally intended for the more effectual triture of the mercury; but it is much more to be regretted, that in a medicine of such activity, the colleges should not have directed the same proportion of mercury to the fatty matter.

If the efficacy of the ointment prepared with the grey oxide were sufficiently established, the facility and certainty of its preparation would be attended with great advantages.

EMPLASTRUM HYDRARGYRI. *Ed.*

Plaster of Quicksilver.

Take of
- Olive oil,
- White resin, each one part;
- Quicksilver, three parts;
- Plaster of semi-vitrified oxide of lead, six parts.

Melt the oil and resin together, and when this mixture is cold, let the quicksilver be rubbed with it till the globules disappear; then add by degrees the litharge plaster, melted, and let the whole be accurately mixed.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. *Lond.*

Plaster of Gum Ammoniac with Quicksilver.

Take of
- Gum ammoniac, strained, one pound;
- Purified quicksilver, three ounces;
- Sulphuretted oil, a drachm, or as much as may be necessary.

Triturate the quicksilver with the sulphuretted oil, until its globules disappear; then gradually add the gum ammoniac melted, and mix them.

EMPLASTRUM LITHARGYRI CUM HYDRARGYRO. *Lond.*

Litharge Plaster with Quickſilver.

Take of
Litharge plaſter, one pound;
Purified quickſilver, three ounces;
Sulphuretted oil, one drachm, or what is ſufficient.
Make the plaſter in the ſame manner as the ammoniacum plaſter with quickſilver.

These mercurial plaſters are conſidered as powerful reſolvants and diſcutients, acting with much greater certainty for theſe intentions than any compoſition of vegetable ſubſtances alone; the mercury exerting itſelf in a conſiderable degree, and being ſometimes introduced into the habit in ſuch quantity as to affect the mouth. Pains in the joints and limbs from a venereal cauſe, nodes, tophi, and beginning indurations, are ſaid to yield to them ſometimes.

UNGUENTUM CALCIS HYDRARGYRI ALBI. *Lond.*

Ointment of the White Calx of Quickſilver.

Take of
The white calx of quickſilver, one drachm;
Ointment of hog's lard, one ounce and a half;
Mix, and make an ointment.

This is very elegant mercurial ointment, and frequently made uſe of in the cure of obſtinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ed.*

Ointment of Red Oxide of Quickſilver.

Take of
Red oxide of quickſilver by nitrous acid, one part;
Hog's lard, eight parts.

The oxide ſhould be reduced to very fine powder before it be added to the axunge. This is an excellent ſtimulating ointment, often of very great ſervice in indolent ill-conditioned ſores, when we wiſh to excite them to greater action. As an eye ointment its effects are moſt remarkable, in the cure of all inflammations of the tunica conjunctiva, and more particularly when there is a thickening and ſwelling of the inner membrane of the palpebræ. In ſuch caſes it ſeems to act with much greater certainty, if applied immediately after the eye-lids have been ſcarified. In inflammation, accompanied with ſpecks, it has a moſt powerful effect in removing both. It is alſo uſeful in all thoſe ophthalmias

which ſo frequently appear after ſmall-pox, meaſles, and eruptive diſeaſes of the hairy ſcalp. It is uſed in the ſame quantity, and in the ſame manner, as the ungt. nitratis hydrargyri; and if it prove too ſtimulating, it may be diluted with axunge.

UNGUENTUM NITRATIS HYDRARGYRI; vulgo UNGUENTUM CITRINUM. *Ed.* UNGUENTUM HYDRARGYRI NITRATI. *Lond. Dub.*

Ointment of Nitrate of Quickſilver, commonly called *Yellow Ointment. Ointment of Nitrated Quickſilver.*

Take of
Quickſilver, one part;
Nitrous acid, two parts;
Olive oil, nine parts; *Ed.*
Hog's lard, three parts, *Ed.* (twelve parts, *Lond. Dub.*)

In a glaſs mortar beat up the ſolution with the lard and oil when getting ſtiff, after having been melted together, until an ointment be formed.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Ed.*

Milder Ointment of Nitrate of Quickſilver.

This is prepared in the ſame way, with three times the quantity of oil and hog's lard.

THIS ointment was formerly prepared with lard alone; but it ſoon became ſo very hard, that it was neceſſary to melt it with freſh axunge before it could be uſed. The ſubſtitution in the preſent formula, of the oil for part of the axunge, obviates in a great meaſure this inconvenience. The hardening is entirely owing to the exceſs of the acid in the ſolution of mercury. But the property which nitrate of mercury, prepared by ebullition, has, of being decompoſed by water, furniſhed me with an eaſy way of getting rid of all exceſs of acid, and of procuring the ſub-nitrate of mercury in the ſtate of the moſt minute diviſion poſſible. An ointment prepared with this ſub-nitrate had a moſt beautiful golden colour; after ſix months was perfectly ſoft, and ſucceeded in curing a very bad caſe of herpes.

Med. uſe.—This ointment has the very beſt effects in herpes, tinea capitis, and ſimilar obſtinate cutaneous affections, and is almoſt ſpecific in pſorophthalmia, in thoſe ſlight excoriations of the tarſi, attended with extreme itching, and in all the imflammations of the eyes, attended by eruptive diſorders of the hairy ſcalp or face. It is moſt conveniently and effectually uſed, by rubbing a piece of the ſize of half a garden pea, with the point

of a hair pencil, over the tarsi, among the roots of the ciliæ, and allowing a small quantity to get on the inner membrane of the palpebræ. In obstinate cases, a weak solution of muriate of mercury, used as a collyrium along with this ointment, proves a most powerful remedy.

UNGUENTUM SUB-ACETITIS CUPRI. *Edin.*
Ointment of Sub-Acetite of Copper.

Take of
Resinous ointment, fifteen parts;
Sub-acetite of copper, one part.

This ointment is used for cleansing sores, and keeping down fungous flesh. Where ulcers continue to run from a weakness in the vessels of the parts, the tonic powers of copper promise considerable advantage.

It is also frequently used with advantage in cases of ophthalmia, depending on scrofula, where the palpebræ are principally affected; but when it is to be thus applied, it is in general requisite that it should be somewhat weakened by the addition of a proportion of simple ointment or hog's lard.

UNGUENTUM OXIDI ZINCI IMPURI; olim UNGUENTUM TUTIÆ. *Edin.*
Ointment of Impure Oxide of Zinc, formerly *Ointment of Tutty.*

Take of
Simple liniment, five parts;
Prepared impure oxide of zinc, one part.

UNGUENTUM TUTIÆ. *Lond. Dub.*
Ointment of Tutty.

Take of
Prepared tutty,
Ointment of spermaceti, (hog's lard, *Dub.*) as much as may be sufficient.
Mix them so as to make a soft ointment.

UNGUENTUM OXIDI ZINCI. *Ed.*
Ointment of Oxide of Zinc.

Take of
Simple liniment, six parts;
Oxide of zinc, one part.

These ointments are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

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CERATUM CARBONATIS ZINCI IMPURI; olim CERATUM LAPIDIS CALAMINARIS. *Ed.*

Cerate of Impure Carbonate of Zinc, formerly *Cerate of Calamine.*

Take of

Simple cerate, five parts;
Prepared impure carbonate of zinc, one part.

CERATUM LAPIDIS CALAMINARIS; olim CERATUM EPULOTICUM. *Lond. Dub.*

Calamine Cerate, formerly *Epulotic Cerate.*

Take of

Calamine, prepared,
Yellow wax, of each half a pound, (one part, *Dub.*)
Olive oil, one pint, (two parts, *Dub.*)

Melt the wax with the oil; and as ſoon as the mixture, expoſed to the air, begins to thicken, mix with it the calamine, and ſtir the cerate until it be cold.

THESE compoſitions reſemble the cerate which Turner ſtrongly recommends in cutaneous ulcerations and excoriations, and which has been uſually diſtinguiſhed by his name. They appear, from experience, to be excellent epulotics, and as ſuch, are frequently made uſe of in practice.

EMPLASTRUM OXIDI FERRI RUBRI; olim EMPLASTRUM ROBORANS. *Ed.*

Plaſter of Red Oxide of Iron, commonly called *Strengthening Plaſter.*

Take of

Plaſter of ſemi-vitrified oxide of lead, twenty-four parts;
White reſin, ſix parts;
Yellow wax,
Olive oil, each three parts;
Red oxide of iron, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients previouſly melted.

THIS plaſter is uſed in weakneſſes of the large muſcles, as of the loins: and its effects ſeem to proceed from the mechanical ſupport given to the part, which may alſo be done by any other plaſter that adheres with equal firmneſs.

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TABLES,

Shewing the Proportion of ANTIMONY, OPIUM, *and* QUICKSILVER, *contained in some Compound Medicines.*

TARTRITE OF ANTIMONY.

Wine of Tartrite of Antimony contains two grains of tartrite of antimony, or tartar-emetic, in the ounce. *Ed.*

OPIUM.

Opiate Confection contains one grain of opium in thirty-six grains. *Lond.*

Opiate or *Thebaic Electuary*, contains in each drachm about a grain and a half of opium. *Edin.*

Electuary of Catechu, or *Japonic Confection*, contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains. *Ed.*

Compound Powder of Chalk with Opium contains one grain of opium in about forty-three grains. *Lond.*

Compound Powder of Ipecacuan contains one grain of opium in ten grains. *Lond.*

Powder of Ipecacuan and Opium contains six grains of opium in each drachm, or one grain in ten. *Ed.*

Opiate Powder contains one grain of opium in ten. *Lond.*

Pills of Opium contain one grain of opium in five. *Lond.*

Opiate or *Thebaic Pills* contain six grains of opium in each drachm, or five grains contains half a grain of opium. *Ed.*

Tincture of Opium or *Liquid Laudanum* is made with two scruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium. *Ed.*

Ammoniated Tincture of Opium, or *Paregoric Elixir*, is made with about eight grains in each ounce of the liquid, or with about one grain in the drachm. *Ed.*

Tincture of Soap and Opium, formerly called *Opiate Liniment*, *Anodyne Balsam*, is made with one scruple of opium in each ounce of the liquid. *Ed.*

Troches of Liquorice with Opium, contain about one grain of opium in each drachm. *Ed.*

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QUICKSILVER.

Quickſilver Pills contain five grains of quickſilver in each drachm. Each pill contains one grain of quickſilver. *Ed.*

Quickſilver Pills contain four grains of quickſilver in twelve grains. *Lond.*

Quickſilver Ointment contains twelve grains of quickſilver in each drachm; made with double quickſilver, each drachm contains twenty-four grains. *Ed.*

Stronger Quickſilver Ointment contains one drachm of quickſilver in two drachms. *Lond.*

Weaker Quickſilver Ointment contains one drachm of quickſilver in ſix drachms.

Quickſilver Plaſter contains about ſixteen grains of quickſilver in each drachm. *Ed.*

Plaſter of Litharge with Quickſilver contains about one ounce of quickſilver in five ounces. *Lond.*

Plaſter of Ammoniac with Quickſilver contains about one ounce of quickſilver in five ounces. *Lond.*

owder of Scammony with Calomel contains one grain of calomel in four grains. *Lond.*

Ointment of Nitrated Quickſilver contains twelve grains of nitrated quickſilver in one drachm. *Lond.*

Stronger Ointment of Nitrate of Quickſilver contains in each drachm four grains of quickſilver and eight of nitrous acid. *Ed.*

Milder Ointment of Nitrate of Quickſilver contains in each ſcruple half a grain of quickſilver, and one grain of nitrous acid. *Ed.*

Ointment of White Calx of Quickſilver contains in each drachm about four grains and a half of the calx. *Lond.*

OR,

One grain of *Tartrite of Antimony* is contained in

Wine of tartrite of antimony. *Ed.*	grs. 240
Wine of antimoniated tartar. *Dub.*	120
Wine of tartariſed antimony. *Lond.*	120
Wine of antimony. *Lond.*	uncertain.

One grain of precipitated *Sulphuret of Antimony* is contained in

Compound pills of antimony. *Dub.*	grs. 2.7

One grain of *Opium* is contained in

Opiate confection. *Lond.*	grs. 36
Opiate electuary. *Ed.*	43
Electuary of catechu. *Ed.*	193

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One grain of *Opium* is contained in

Compound electuary of catechu. *Dub.*	grs. 199
Troches of liquorice with opium. *Ed.*	75
Compound troches of liquorice. *Dub.*	60
Pills of opium. *Lond.*	5
Opiate pills. *Ed.*	10
Opiate powder. *Lond.*	10
Compound powder of chalk with opium. *Lond.*	43
Compound powder of ipecacuan. *Lond. Dub.*	10
Powder of ipecacuan and opium. *Ed.*	10
Tincture of opium. *Ed. Lond. Dub.*	12
Camphorated tincture of opium. *Lond.*	244
Ditto ditto *Dub.*	196
Ammoniated tincture of opium. *Ed.*	68
Tincture of ſoap and opium. *Ed.*	31.5

One grain of *Quickſilver* is contained in

Quickſilver pills. *Lond.*	grs. 3.
Ditto *Dub.*	2.5
Ditto *Edin.*	4
Stronger quickſilver ointment. *Lond. Dub.*	2
Weaker quickſilver ointment. *Lond. Dub.*	6
Quickſilver ointment. *Edin.*	5
Quickſilver plaſter. *Ed.*	5.5
Litharge plaſter with quickſilver. *Lond.*	5.
Ammoniac plaſter with quickſilver. *Lond.*	5.

One grain of *Calomel* is contained in

Powder of ſcammony with calomel. *Lond.*	grs. 4
Compound antimonial pills. *Dub.*	2.7

One grain of the *Grey Oxide of Quickſilver* is contained in

Ointment of the grey oxide of quickſilver. *Ed.*	grs. 4

One grain of the *Red Oxide of Quickſilver* is contained in

Ointment of red oxide of quickſilver. *Ed.*	grs. 9

One grain of *Submuriate of Quickſilver and Ammonia* is contained in

Ointment of white calx of quickſilver. *Lond.*	grs. 13

One grain of *Nitrate of Mercury* is contained in

Stronger ointment of nitrate of mercury. *Ed.*	grs. 5
Ointment of nitrated quickſilver. *Lond. Dub.*	5
Milder ointment of nitrate of quickſilver. *Ed.*	13

In many inſtances theſe proportions are only to be conſidered as approximations to the truth, as they are calculated from the

quantities of the ingredients taken to form the preparation, not from the quantities which exiſt in it after it is formed. The *nitrate of mercury*, for example, in the different ointments into which it enters, is eſtimated as equal to the whole quantity of mercury and nitrous acid employed to form it, although, from the very nature of the preparation, it cannot be ſo much. In the ſolutions of opium, the opium is eſtimated as equal to the whole quantity employed, although not above two thirds of it be diſſolved. Laſtly, no allowance is made for the loſs by evaporation; and hence, notwithſtanding the difference by calculation, the Edinburgh *troches of liquorice with opium* contain probably as much opium as thoſe of Dublin; for the former, being made with ſyrup, will loſe more in drying than the latter, which are made with extract of liquorice.

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POSOLOGICAL and PROSODIAL TABLE.

ACETIS potaſſæ, ℈ i to ʒ i.
Acetītis ammonĭæ aqua, ʒ ij to ʒ vi.
Acĭdum acetōſum impurum, ʒ i to ℥ ſs; ℥ i to ℥ ij, *in glyſters.*
destillātum, do.
aromătĭcum *analeptic.*
forte, ℈ i to ʒ i.
camphorātum *analeptic.*
Acĭdi acetōſi ſyrupus, ʒ i to ʒ ij.
carbōnĭci aqua, ℔ ij *daily.*
Acĭdum benzoĭcum, gr x to ʒ ſs.
muriăticum, gr x to gt xl.
nitrōſum, gt v to gt xx.
dilūtum, gt x to xl.
ſuccĭnĭcum, gr v to ℈ i.
ſulphŭrĭcum dilūtum, gt xv to gt xxx.
aromăticum, gt xv to xxx.
Aconīti napelli herba, gr i to gt v.
ſuccus ſpiſſatus, gr ½ to gr iij.
Acŏri călămi radix, ℈ i to ʒ i.
Aeſcŭli hippocaſtăni cortex, ʒ ſs to to ʒ i.
Aether ſulphurĭcus, gt xx to ʒ i.
cum alcohōle, ʒ ſs to ʒ ij.
cum alcohōle aromatĭcus, ʒ ſs to ʒ ij.
Alcŏhol, ʒ ſs to ʒ i.
ammoniātum, ʒ ſs to ʒ i.
aromaticum, ʒ ſs to ʒ i.
fœtidum, ʒ ſs to ʒ i.
ſuccinātum, gt x to xl.

Allĭi ſatīvi radix, ʒ i to ʒ ij.
Alŏës perfoliātæ ſocotorīnæ ſuccus ſpiſſatus, gr v to xv.
pulvis cum canēlla, gr x to ℈ i.
pulvis cum ferro, gr v to ℈ i.
pulvis cum guāīăco, gr x to ℈ i.
pilŭlæ, gr xv to ʒ ſs.
pilulæ compoſĭtæ, gr x to xxv.
pilulæ cum aſſa fœtĭda, gr x to ℈ i.
cum cŏlŏcynthĭde, gr v to gr x.
cum myrrha, gr x to ℈ i.
tinctūra, ʒ ſs to ʒ ij.
tinctura cum myrrha, ʒ ſs to ʒ ij.
tinctura æthereĕæ, ʒ ſs to ʒ ij.
vīnum, ℥ ſs to ℥ iſs.
extractum, gr v to xv.
Althææ officinālis decoctum, ad libitum.
ſyrūpus, ʒ i to ʒ iij.
Alūmĭnæ ſulphas, ℈ ſs to ℈ i.
ſulphātis pulvis compoſitus, gr x to ʒ ſs.
Ammōniæ aqua, gt x to xv.
acetitis aqua, ℥ ſs.
hydro-ſulphurētum, gt v to xij.
carbōnas, gr v to gr xv.
carbōnātis aqua, gt xx to ʒ i.
Ammōniăcum gummi resīna, gr x to ʒ ſs.
Ammōniaci lac, ʒ iij to ℥ i.
Amōmi zingĭbĕris radix, gr v to ℈ i.
ſyrupus, ʒ i to ʒ iij.
tinctura, ʒ i to ʒ iij.
repentis ſemina, gr v to ℈ i.
tinctura, ʒ i to ʒ iij.
tinctura compoſita, ʒ i to ʒ iij.
zedoārĭæ radix, ℈ i to ʒ i.
Amygdăli commūnis oleum fixum, ʒ iij to ℥ i.
emulſio, ℔ ij *daily*.
Amy̆li mucilāgo, ℥ iv to ℥ vj *in glyſter.*
trochīſci, ʒ i to ʒ ij.
Amȳrĭdis elĕmifĕræ reſina, gr x to ʒ ſs.
gileadenſis reſina liquida, ℈ i to ʒ i.
Anēthi grăvĕŏlentis ſemĭna, ℈ i to ʒ i.
aqua deſtillata, ℥ i to ℥ iij.
fœnĭcŭli ſemina, ℈ i to ʒ i.
aqua deſtillāta, ℥ i to ℥ iij.
oleum volatĭle, gtt ij to gt v.
Angĕlĭcæ archangĕlĭcæ radix, herba, ſemen, ʒ ſs to ʒ iij.
Anguſtūræ cortex, gr x to ℈ i.

Anthemĭdis nobĭlis flores, ℈ i to ʒ i.

decoctum, *in glyster.*

extractum, gr x to ʒ i.

pyrēthri radix, gr iij to ℈ i.

Antimōnii ſulphurētum præparātum, gr xv to ℈ ij.

oxĭdum cum ſulphŭre per nitrātem potaſſæ, gr i to iv.

cum ſulphŭre vitrificātum, gr $\frac{1}{4}$ to iſs.

vitrificātum cum cēra, gr iij to ℈ i.

ſulphurētum fuſcum (*kermes mineralis*) gr i to iſs.

præcipitātum, gr i to iv.

oxĭdum cum phoſphāte calcis, gr iij to viij.

et potaſſæ tartris, gr i to i.

tartrītis vinum, ʒ ij to vi.

vinum, ʒ iij to ℥ ſs.

oxĭdum album (*antimonium calcinatum*) gr x to ʒ ſs.

pilulæ compoſitæ, gr iij to v.

Apĭi petrŏsĕlīni ſemĭna, ℈ i to ij.

Arbŭtĭ uvæ urſi folia, gr x to ℈ ij.

Arctĭi lappæ radix, *a decoction of* ℥ ij *in* ℔ ij *of water, daily.*

Argenti nitras, gr $\frac{1}{8}$ to $\frac{1}{2}$.

Ari maculāti radix, gr vi to ℈ i.

conſerva, ʒ ſs to ʒ iſs.

Ariſtolōchiæ ſerpentāriæ radix, ℈ i to ʒ i.

tinctura, ʒ i to ʒ iij.

Arnĭcæ montānæ herba, gr v to x.

Arſenĭci oxĭdum album, gr $\frac{1}{8}$.

Artĕmiſiæ abrŏtāni folia, ℈ i to ʒ i.

marĭtĭmæ cacūmina, ℈ i to ʒ i.

conſerva, ʒ ij to ℥ ſs.

ſantonĭcæ cacūmina, ʒ ſs to ʒ i.

abſinthĭi herba, ℈ i to ℈ ij.

Asări europææ folia, gr ij to iv.

pulvis compoſitus, gr v to ℈ i.

Aſtragăli tragăcanthæ pulvis compoſitus, ʒ ſs to ʒ iſs.

Atrŏpæ belladonnæ folia, gr ſs to gr v.

ſuccus ſpiſſatus, gr $\frac{1}{4}$ to gr iij.

Barytæ muriātis ſolūtio, gr v to x.

Bitūmen petrolĕum ſulphurātum, gr v to xxx.

Bitūminis petrolĕi olĕum, gr x to xxx.

Bōlus gallĭcus, ℈ i to ʒ i.

Bubōnis galbăni gummi resĭna, gr x to ℈ i.

pilŭlæ compoſitæ, gr x to ʒ ſs.

tinctūra, ʒ i to iij.

Calcis aqua, ℥ iv to ℔ i *daily.*

Calcis muriātis ſolūtio, gt xl to ʒ i.
carbōnas præparātus, ℈ i to ʒ i.
carbōnātis miſtūra, ℥ i to ij.
pulvis composĭtus, ℈ i to ij.
carbōnātis pulvis compoſitus cum opio, gr xv to ℈ ij.
trochiſci, ʒ i to ij.
Cancri aſtăci lapilli præparāti, ʒ ſs to i.
pagūri chēlæ præparātæ, ʒ ſs to i.
chelarum pulvis compoſitus, ℈ i to ij.
Canellæ albæ cortex, gr xv to ℈ ij.
Capsĭci annui fructus, gr v to x.
Cardamīnes prătenſis flores, ʒ ſs to ʒ i.
Cari carŭi ſemĭna, gr x to ʒ i.
oleum volatile, gt i to v.
ſpiritus, ʒ ij to ℥ i.
Caryophylli arŏmatĭci floris germen, gr v to ℈ i.
oleum volatile, gt iij to v.
Caſſiæ fiſtŭlæ pulpa, ℥ ſs to i.
electuarium, ʒ ij to ℥ i.
Caſſiæ ſennæ folia, ℈ i to ʒ i.
pulvis compoſitus, ℈ i to ʒ i.
infūſum, ℥ i to iij.
infūſum tartarisātum, ℥ iſs to iij.
tinctura, ℥ ſs to ℥ i.
electuārium, ʒ i to ℥ ſs.
extractum, gr x to ʒ ſs.
Caſtŏrĕum roſsĭcum, gr x to ℈ i.
Caſtorei tĭnctūra, ʒ i to ij.
composĭta, ʒ ſs to i.
Centaureæ benĕdictæ herba, gr xv to ʒ i.
Cephaëlĭdis ipecacŭanhæ radix, ℈ i to ʒ ſs.
vinum, ℥ ſs to ℥ i.
pulvis compoſitus, ℈ ſs to ℈ i.
Cēra, ℈ i to ʒ i, *in emulſion.*
Cervi elăphi cornu decoctum, ℥ ij to iv.
uſtum, ℥ ſs to ℥ i ſs.
Chironĭæ centaurĕi ſummitates, ℈ i to ʒ i.
Cinăræ ſcōlymi folia, ℥ ſs to i, *of the expreſſed juice.*
Cinchōnæ officinālis cortex, ℈ i to ʒ ij.
decoctum, ℥ i to iv.
infūſum, ℥ i to iv.
tinctūra, ʒ i to ʒ ij.
tinctūra ammoniata, ʒ ſs to ij.
tinctūra compoſita, ʒ i to iij

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Cinchōnæ officinālis extractum, gr x to ℈ i.
  extractum cum resīna, gr v to ℈ i.
Ciſſampĕli pareiræ radix, gr xv to ℈ ij.
Ciſti cretĭci resīna (Ladănum), gr x to ʒ ſs.
Citri aurantĭi folia, flores, gr x to ʒ i.
  fructus cortex exterior, ʒ ſs to ℈ ij.
  aqua deſtillata, ℥ i to iij.
  ſyrūpus corticis, ʒ i to ij.
  tinctūra corticis, ʒ i to ij.
  conſerva cortĭcis, ʒ ij to v.
Citri medĭcæ, ſuccus expreſſus, ʒ i to ℥ ſs.
  ſuccus ſpiſsātus, ʒ i to ℥ ij.
  ſyrūpus ſucci, ʒ i to iij.
  fructus cortex exterior, ℥ ſs to ij, *in infuſion.*
  aqua deſtillata, ℥ i to iij.
  oleum volatile, gt ii to gt v.
Cochlearĭæ officinālis herba, ℥ i to iv, *of the juice.*
  ſuccus compoſitus, ℥ i to iv.
Cochleariæ armoracĭæ radix, ℈ i to ʒ i.
  ſpirĭtus composĭtus, ʒ iij to ℥ i.
Colchĭci autumnālis radix, gr ſs to iij.
  ſyrūpus, ʒ i to ℥ i.
  oxymel, ʒ i to ℥ ſs.
Cŏlombæ rādix, gr x to ℈ i.
  tinctura, ʒ i to iij.
Confectio aromatĭca, gr xv to ʒ i.
  opiāta, gr x to ʒ ſs.
Conĭi maculati folia, gr iij.
  ſuccus ſpiſsātus, gr ½ to gr iij.
Convolvŭli ſcammōnĭæ gummi resīna, gr v to gr xv.
  pulvis composĭtus, gr x to gr xv.
  pulvis cum aloe, gr x to xv.
  pulvis cum calomelāne, gr x to ℈ i.
  electuārĭŭm, ʒ ſs to i.
Convolvuli jalapæ radix, gr x to ʒ ſs.
  pulvis compoſitus, ʒ ſs to ʒ i.
  tinctura, ʒ i to iij.
  extractum, ℈ ſs to ℈ i.
Copaifĕræ officinālis resīna, gt xv to ʒ ſs.
Corĭandri ſatīvi semĭna, ℈ i to ʒ i.
Croci ſatīvi floris ſtigmăta, gr v to ʒ ſs.
  ſyrūpus, ʒ i to ij.
  tinctūra, ʒ ſs to ij.
Crotōnis eleutheriæ cortex, ℈ i to ʒ ſs.

Crotōnis eleutheriæ extractum, gr x to ʒ ſs.

tinctūra, ʒ i to ℥ ſs.

Cŭcŭmis cŏlŏcynthĭdis fructus medulla, gr iij to viij.

extractum compositum, gr v to ʒ ſs.

Cumīni cymīni ſemina, ℈ i to ʒ i.

Cupri ſub-acētis, gr $\frac{1}{8}$ to $\frac{1}{2}$.

ammoniarētum, gr $\frac{1}{2}$ to v.

ammoniarēti pilulæ, No. i.

aqua ammoniareti, gt v to gt xxx.

ſulphas, gt ij to x.

Curcumæ longæ radix, ℈ i to ʒ i.

Daphnes mezerĕi radīcis cortex, gt i to x.

Daphnes mezerĕi decoctum, ℥ iv to ℔ ſs.

Datūræ ſtramonĭi herba, gr i to v.

Dauci carotæ ſemĭna, ℈ i to ʒ i.

Delphinĭi ſtaphisāgrĭæ ſemina, gr iij to x.

Dianthi caryophylli flores, ℈ i to ʒ i.

ſyrūpus, ʒ i to ij.

Digitālis purpŭreæ folia, gr ſs to iij.

infuſum, ʒ iij to ℥ i.

tinctura, gr x to xl.

Dŏlĭchi prurĭentis pubes leguminis rigida, gr v to x.

Dorſtenĭæ contrayērvæ radix, ℈ i to ʒ ſs.

pulvis compoſitus, ℈ i to ij.

Electuarium opiātum, ℈ i to ij.

Eryngĭi maritĭmi radix, ʒ ij to iij.

Ferri limatura, gr iij to gr x.

oxĭdum nigrum purificātum, do.

carbōnas, do.

carbōnas præcipitātus, do.

ſuper-carbōnātis aqua, ℔ i, *daily*.

ſulphas, gr i to v.

et potaſſæ tartris, gr x to ʒ ſs.

et ammōniæ murĭas, gr iij to xv.

murĭatis tinctūra, gt x to xx.

et ammōniæ tinctura, gt xv to ʒ i.

vinum, ʒ ij to vj.

acetāti tinctura, gt x to xxx.

Ferŭlæ aſſæ fœtĭdæ gummi resīna, gr x to ʒ ſs.

lac, ℥ ſs to ℥ i ſs.

tinctura, ʒ ſs to ʒ i.

pilŭlæ composĭtæ, gr x to xx.

Fici carĭcæ fructus, No. vi, *in decoction*.

Frăxĭni orni ſuccus concrētus (*manna*), ℥ ſs to i ſs.

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Fraxĭni orni ſucci concreti ſyrupus, ℥ i to ℥ ij.
Fumārĭæ officinālis herba, ℥ i to ℥ ij, *of the expreſſed juice.*
Gentiānæ lutĕæ radix, gr x to ℈ ij.
infūſum compoſitum, ℥ ſs to ij.
tinctūra compoſita, ʒ i to iij.
vinum compoſitum, ℥ ſs to ℥ i.
extractum, gr x to ℈ ij.
Geoffrææ inermis cortex, ℈ i to ij.
decoctum, ℥ i.
Glycyrrhīzæ glabræ radix, ʒ ſs to i.
extractum, ʒ i to iij.
trochiſci, ʒ i to ij.
trochiſci cum opio, ʒ i, *during the day.*
Gratiŏlæ officinalis herba, gr x to ℈ i.
Guāĭăci officinālis resīna, gr x to ʒ ſs.
tinctūra, ʒ ij to ℥ ſs.
tinctūra ammōniāta, ʒ i to ij.
decoctum compoſitum, ℥ iv to vj.
Hæmatoxy̆li Campechiāni extractum, ℈ i to ij.
Hellĕbŏri nigri radix, gr x to ℈ i.
extractum, gr v to gr x.
tinctura, ʒ ſs to iſs.
Hellebori fœtĭdi folia, ℈ i to ij.
Hordĕi diſtĭchi decoctum, ℥ ij to vj.
compoſitum, ℥ iij to vj.
Hydrargy̆rum purificatum, ℥ ij to iv.
cum crēta, gr x to ʒ ſs.
Hydrargy̆ri oxidum cinereum, gr i to gr v.
pilūlæ, gr v to xv.
oxĭdum rubrum, gr ſs.
ſub-ſulphas, gr i to gr v.
ſub-murĭas, gr i to gr v.
præcipitātus, do.
acētis, gr i to vj.
murĭas, gr $\frac{1}{8}$ to $\frac{1}{4}$.
ſulphurētum nigrum, ℈ i to ʒ i.
rubrum, gr x to ʒ ſs.
Hyoſciămi nigri herba, ſemen, gr iij to gr x.
ſuccus ſpiſſatus, gr i to v.
tinctura, ℈ i to ʒ i.
Hyperĭci perforāti flores, ℈ i to ʒ i.
Hyſsōpi officinālis herba, ℈ i to ʒ i.
Inŭlæ hĕlĕnii radix, ℈ i to ʒ i.
Irĭdis florentīnæ radix, ℈ i to ʒ i.

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Irĭdis pſeudăcŏri radicis ſuccus expreſſus, gr lx to lxxx.

Iſis nobĭlis (corallium), gr x to ʒ i.

Juglandis regiæ fructus immatūrus, *externally in decoction.*

Junĭpĕri commūnis baccæ, ʒ ſs to i.

oleum volatile, gtt ij to x.

ſpiritus compoſitus, ʒ ij to vi.

Juniperi lycĭæ gummi reſina (Olĭbănum), ℈ i to ij.

Juniperi ſabīnæ folia, gr xv to ℈ ij.

extractum, gr x to ʒ ſs.

tinctura compoſita, gr xxx to ʒ i.

Kīno, gr x to ℈ i

tinctura, ʒ i to iij.

Lactūcæ virōſæ ſuccus ſpiſsātus, gr iij to xv.

Lauri cinnamōmi cortex, gr v to ℈ i.

aqua deſtillata, ℥ i to iij.

ſpiritus, ʒ ij to ℥ i.

tinctura, ʒ i to ℥ iij.

tinctura compoſita, ʒ ſs to ij.

oleum volatile, gtt i to iij.

Laurus caſſia, *conſiderably weaker than the preceding ſpecies, in other reſpects ſimilar.*

Lauri camphŏræ camphora, gr iij to ℈ i.

emulſio, ℥ ſs to ij.

acidum acetōſum, *odour analeptic.*

Lauri nobĭlis folia, baccæ, gr x to ʒ ſs.

Lauri ſaſsăfras lignum, radix, eorumque cortex, ℈ i to ʒ i.

oleum volatile, gt ij to gt x.

Lavandŭlæ ſpicæ florentes, ℈ i to ʒ i.

ſpirĭtus, *an analeptic perfume.*

ſpirĭtus compoſĭtus, ʒ ſs to ij.

oleum volatile, gt i to v.

Leontŏdi taraxăci radix, herba, ℥ i to ij, *of the juice.*

Lilii candidi radix, *externally as a poultice.*

Līni uſitatiſſimi ſemina, *in infuſion,* ℥ i *to water* ℔ i.

oleum fixum, ℥ ſs to i; *or, in clyſters,* ℥ iij to vj.

Lini cathartĭci herba, ʒ i, *or an infuſion of a handful of the freſh plant.*

Lobēliæ ſyphilitĭcæ radix, ℥ ſs, *boiled in* ℔ xij *of water to* ℔ viij; *half a pint twice a-day.*

Magnēsĭa, gr x to ℈ i.

Magneſiæ carbōnas, ℈ i to ʒ i.

trochiſci, ʒ i to ij.

ſulphas, ℥ ſs to ℥ i.

Malvæ ſylveſtris folia, flores, ʒ ſs to i.

Marrŭbĭi vulgāris herba, ʒ ſs to i.
Mel deſpumātum, ʒ ij to ℥ i, *in clyſters* ℥ iij.
,, acetatum, ʒ i to ij.
Melăleucæ leucădendri oleum volatile, gᵗ i to v.
Meliſſæ officinālis herba, gʳ x to ℈ ij.
Melŏes vesĭcatorii pulvis, gʳ ſs to i.
tinctura, gᵗ x to xxx.
Menthæ virĭdis herba, gʳ x to ʒ i.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, gᵗ ij to v.
Menthæ piperītæ herba, gʳ x to ℈ ij.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, gᵗ i to gᵗ iij.
Menthæ pūlĕgĭi herba, gʳ x to ℈ ij.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum, gᵗ ij to v.
Menўanthis trĭfoliātæ herba, ʒ ſs to ℥ i.
Mimŏſæ catĕchu extractum, gʳ xv to ʒ ſs.
electuārium, ℈ i to ʒ i.
infuſum, ℥ i to ij.
tinctura, ʒ i to iij.
Mimoſæ nilotĭcæ gummi, ʒ i to ij.
emulſio, ℔ ij *daily.*
mucilāgo, ℥ ſs.
Momordĭcæ elaterĭi ſuccus ſpiſſatus, gʳ ſs to gʳ vj.
Mori nigræ ſyrupus, ʒ i to ℥ ſs.
Moſchus, gʳ v to ℈ i.
Moſchi tinctura, ʒ i to ℥ ſs.
miſtūra, ℥ ſs to iſs.
Murĭas ammoniæ, gʳ x to ʒ ſs.
Murĭas ſodæ, ʒ iij to ℥ ſs, *in clyſters.*
Myrīſtĭcæ moſchātæ fructus nucleus, gʳ v. ad ℈ i.
oleum volatile, gᵗ ij ad gᵗ v.
ſpiritus, ʒ ij ad ℥ i.
nŭcis involucrum, macis, dictum.
involucri oleum expreſſum, *externally.*
Myroxўli peruiferi balſamum, gʳ v to ʒ ſs.
tinctura, ʒ ſs to ʒ i.
Myrrha, gʳ x to ʒ ſs.
Myrrhæ tinctura, ʒ ſs to iſs.
pulvis compoſitus, gʳ xv to ℈ ij.

Myrti pimentæ fructus, gr v to ℈ i.
aqua deſtillata, ℥ i to iij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, gt iij to v.
Nicotiānæ tabāci folia, gr ſs to v.
vinum, gt xxx to gt lxxx.
Oleæ Europeæ oleum fixum, ʒ iij to ℥ i.
Oleum animale, gt x to xl.
vini, gt i to iv.
Oniſci aſelli (Millepĕdæ) præparati, ʒ i to ij.
Opĭum, gr ſs to gr ij.
Opĭi pilulæ, gr v to ℈ i.
tinctura, gr xx to xl.
ammoniāta, ʒ ſs to ij.
camphorāta, ʒ ſs to ij.
Orīgăni vulgāris herba, gr x to ℈ i.
oleum volatile, gt i to ij.
majorānæ herba, ℈ i to ʒ i.
Oſtrĕæ edulis teſtæ præpărātæ, ʒ ſs to i.
Ovis ariĕtis sēvum præpărātum, *externally.*
Oxalis acētōsēllæ folia, ℥ ſs to iſs *of the juice.*
conſerva, ʒ ij to ℥ ſs.
Pæneæ ſarcŏcōllæ gummi reſina (ſarcocolla), gr x to ʒ ſs.
Panăcis quinquefolii radix, ℈ i to ʒ i.
Papāveris rhœæ flores, ʒ i *in decoction.*
ſyrupus, ʒ i to iij.
Papāveris ſomniferi ſyrupus, ℥ ſs to i *to adults;* ʒ i to ij *to children;* one ounce *is ſuppoſed to contain one grain of opium.*
extractum, gr i to v.
ſuccus ſpiſſatus (Opium), gr ſs to gr ij.
Parietārĭæ officinalis herba, gr x to ʒ i, or ℥ i to iij *of the juice.*
Paſtinācæ opŏpŏnăcis gummi reſina, gr x to ℥ ſs.
Phaſiāni galli ovōrum teſtæ præpărātæ, ʒ ſs to i.
Phyſetĕris macrocephăli ſevum (ſpermăcēti), ʒ ſs to i ſs.
Pimpĭnellæ anīsi ſemĭna, gt xv to ʒ ſs.
ſpirĭtus composĭtus, ʒ ij to ℥ i.
olĕum volatĭle, gt v to gt x.
Pini balsămeæ reſina liquida (Balſamum Canadenſe), gr v to ʒ ſs.
Pini larĭcis reſina liquida (Terebinthĭna vĕnĕta), ℈ i to ij; *and in clyſters,* ℥ ſs to i.
Pini ſylveſtris reſina liquida (Terebinthĭna vulgāris), gt xv to ℈ ij; *and in clyſters,* ℥ ſs to i.
reſina empyreumatica (Pix liquida), ℈ i to ʒ i.
Pini oleum volatile (Oleum terebinthinæ) rectificatum, gt x to ʒ i.

Pipĕris nigri baccæ, gr v to ℈ i.
cubebæ baccæ, gr v to ℈ i.
longi fructus, gr v to ℈ i.
Pistaciæ lentiſci reſina (Maſtĭche), gr v to ʒ ſs.
terĕbinthi (Trebinthina Chia), ℈ i to ʒ i.
Plumbi acetis, gr ſs to ij.
Polygălæ ſenĕgæ radix, ℈ i to ʒ ſs.
decoctŭm, ℥ i to ij.
Polўgŏni biſtortæ radix, gr xv to ʒ i.
Polўpodii filĭces māris radix, ʒ i to ʒ ij.
Potaſſæ aqua, gt x to xxx.
acĕtis, ℈ i to ℈ ij.
ſuper-carbōnātis aqua, ℥ vj to ℔ ſs.
ſulphurētum, gr v to xv.
tartris, ℈ i to ℥ ſs.
ſuper-tartris, ʒ i to ℥ i.
ſulphas, ℈ i to ℥ ſs.
carbonas, gr v to ℈ i.
carbonātis aqua, ʒ ſs to ʒ i.
nitras, gr v to ʒ ſs.
nitrātis trochiſci, ʒ i to ij.
ſulphas cum ſulphŭre, gr xv to ʒ ſs.
Potentillæ reptantis radix, ʒ ſs to i.
Prūni domeſtĭcæ fructus, ℥ ij to iij, *ſtewed.*
ſpinōſæ fructus.
conſerva, ʒ ij to ℥ ſs.
Pterŏcarpi dracōnis resīna, gr x to ℈ ij.
Pulvis aromaticus, gr v to gr x.
opiātus, gr v to gr x.
Pūnĭcæ granāti fructus cortex, ℈ i to ʒ i.
floris petala, ʒ ſs to iſs.
Quaſſiæ ſimarūbæ cortex, ʒ ſs to i; *or,* ʒ ij *in decoction.*
excelſæ lignum, gr v to ℈ i; *or,* ℥ i to ij *of an infuſion of* ʒ ij *in* ℔ i *water.*
Quercus robŏris cortex, gr xv to ʒ ſs; *or,* ℥ i to ij *of an infuſion of* ʒ ij *in* ℔ i *water.*
Quercus cerris gallæ, gr x to ʒ ſs.
Rhamni cathartici ſuccus expreſſus, ℥ ſs to i.
ſyrūpus, ℥ ſs to iſs.
Rhei palmāti radix, gr x to ℈ ij.
infuſum, ℥ ſs to iſs.
pilŭlæ compoſitæ, gr x to ʒ ſs.
tinctura, ℥ ſs to i ſs; *or as a ſtomachic,* ʒ ij to ℥ ſs.
compoſita, ℥ ſs to i ſs.

Rhei palmāti tinctura cum aloe, ℥ ſs to i.
cum gentiana, ℥ ſs to iſs; *or,* ʒ ij to ℥ ſs, *as a ſtomachic.*
vinum, ℥ ſs to i ſs.
Rhŏdŏdendri chrysānthi folia, gr v to x; *or an infuſion of* ʒ ij *in* ℥ x *of water.*
Rhi toxicodendri folia, gr ſs to i.
Ribis nigri ſuccus ſpiſſatus, ℥ ſs to i.
ſyrupus, ʒ i to ℥ ſs.
Ricīni commūnis oleum expreſſum. ℥ ſs to ℥ i.
Roſæ gallicæ petala, ℈ i to ʒ i.
conſerva, ʒ ij to ℥ ſs.
infūſum, ℥ ij to vj.
ſyrūpus, ʒ i to ij.
mel, ʒ i to ij.
Roſæ damaſcēnæ petala, ℈ i to ʒ i.
aqua deſtillata, ℥ i to iij.
ſyrupus, ʒ ij to ℥ ſs.
Roſæ caninæ (Cynoſbatus) conſerva, ʒ ij to vj.
Roris marīni officinālis ſummitates, gr x to ℈ ij; *and in infuſion* ʒ i to i ſs.
oleum volatile, gtt ij to gt v.
ſpiritus.
Rubĭæ tinctōrum radix, ℈ i to ʒ ſs.
Rŭbi idæi ſyrupus, ʒ i to ſs.
Rumĭcis acetōſæ folia, ℥ i to ℥ ij *of the juice.*
Rūtæ grăvĕŏlentis herba, gr xv to ℈ ij.
extrăctum, gr x to ℈ i.
Sagapēnum gummi reſina, gr x to ʒ ſs.
Salicis fragĭlis cortex, ℈ i to ʒ i.
Salvĭæ officinālis folia, gr xv to ℈ ij.
Sambūci nigri cortex interior, gr v to ℈ i.
ſuccus ſpiſſatus, ℥ ſs to i ſs.
Sapo, gr x to ʒ ſs.
Scillæ marităimæ radix recens, gr v to gr xv.
radix ſiccāta, gr i to gr iij.
ſyrūpus, ʒ i to ij.
mel, ʒ ſs to ij.
oxymel, ʒ ſs to ij.
acētum, ʒ ſs to ʒ iſs.
conſerva, ʒ ſs to i.
tinctura, gtt x to xx.
pilulæ, gr x to ℈ i.
Sināpĕos albæ ſemina, ℥ ſs to ℥ i.
oleum fixum, ℥ ſs to i.

Sĭi nodiflōri herba, ℥ ij *or* iij *of the juice.*
Sisymbrĭi nasturtii herba, ℥ i *or* ij *of the juice.*
Smilăcis sărsăparĭllæ radix, ℈ i to ʒ ſs.
decoctum, ℥ iv to ℔ ſs.
compositum, ℥ iv to ℔ ſs.
Sodæ carbōnas, gr x to ʒ ſs.
super-carbonātis aqua, ℥ iv to ℔ ſs.
et potassæ tartris, ʒ vj to ℥ i ſs.
sulphas, ℥ ſs to iſs.
phosphas, ℥ ſs to iſs.
murĭas, ʒ iij to ℥ ſs, *in glysters.*
sub-boras, gr x to ʒ ſs.
Solāni dulcamāræ stipites, ʒ ſs to ʒ i in infusion.
Spartĭi scoparĭi summitātes, ℈ i to to ʒ i.
extractum, ʒ ſs to i.
Spigēliæ marilandĭcæ radix, ʒ ſs to ℈ ij.
Spirĭtus ætheris sulphurĭci composĭtus, ʒ ſs to iſs.
nitrosi, ʒ ſs to ʒ i.
Spongĭa usta, ʒ ſs to i.
Stalagmitĭdis cambogiodis succus spissatus, (Gambogia) gr v to gr x.
Stanni pulvis et limatura, ʒ i to ij.
Styrăcis officinālis balsămum, gr x to ʒ ſs.
benzoini balsămum, gr x to ʒ ſs.
tinctūra composita, ʒ ſs to i.
Succĭnum præparātum, ℈ i to ʒ i.
Succĭni oleum rectificātum, gt x to xx.
sulphas alūminæ, ℈ ſs to ℈ i.
Sulphur præcipitātum, ʒ i to iij.
sublimātum lotum, ℈ i to ʒ i.
Sulphūris trŏchĭsci, ʒ i to iij.
Swieteniæ mahăgŏni cortex, ℈ i to ij.
febrifŭgæ cŏrtex, ℈ i to ij.
Tamărindi indĭcæ fructus, ℥ ſs to iſs.
infūsum cum cassia senna, ℥ ij to iv.
Tanacēti vulgăris herba, ʒ ſs to i.
Teucrĭi māris herba, gr x to ʒ ſs.
scordĭi herba, ℈ i to ʒ i.
Toluifĕræ balsămi balsămum, gt xv to ℈ ij.
syrūpus, ʒ i to iij.
tinctura, ʒ ſs to ij.
Tormentĭllæ erectæ rădix, ℈ i to ij.
Tussilāgĭnis farfăræ herba, ℥ ij to iv *of the expressed juice.*
Ulmi campestris cortex interior, ℈ i to ʒ i.
decoctum, ℥ iv to ℔ ſs.

Urtīcæ dioicæ herba, ℥ i to ij *of the expreſſed juice.*
Valeriānæ officinalis radix, ℈ i to ʒ i.
tinctura, ʒ ij to ℥ ſs.
ammoniata, ʒ i to ij.
extractum.
Verātri albi radix, gr v to ℈ i.
tinctura, gt v to x.
Veronicæ beccabungæ herba, ℥ ij to iv *of the juice daily.*
Viŏlæ odorātæ ſyrupus, ʒ i to ij.
Wintĕræ aromaticæ cortex, gr x to ℈ i.
Zinci oxīdum, gr iij to x.
ſulphas, gr vj to ʒ ſs.

N. B. Theſe are in general the doſes for adults from twenty to ſixty, but they may be diminiſhed for children and people paſt the prime of life, nearly in the following proportions.

	Ages.	Proportionate doſes.
Months	2	$\frac{1}{15}$
	7	$\frac{1}{12}$
	14	$\frac{1}{8}$
	28	$\frac{1}{5}$
Years	3	$\frac{1}{4}$
	5	$\frac{1}{3}$
	7	$\frac{1}{2}$
	14	$\frac{2}{3}$
	63	$\frac{11}{12}$
	77	$\frac{5}{6}$
	100	$\frac{4}{6}$

It may alſo be obſerved, that ſixty drops of water, one hundred of diluted alcohol, or an hundred and twenty of alcohol, are equal to a drachm by meaſure

 000721

TABLE of Names changed in the last Edition of the London Pharmacopœia.

Names changed.	*New names.*
A.	
ACETUM ſcilliticum.	ACETUM ſcillæ.
Æthiops mineralis.	Hydrargyrus cum ſulphure.
Aqua aluminoſa bateana.	Aqua aluminis compoſita.
calcis ſimplex.	calcis.
cinnamomi ſimplex.	cinnamomi.
ſpirituoſa.	Spiritus cinnamomi.
fortis.	Acidum nitroſum dilutum.
hordeata.	Decoctum hordei.
juniperi compoſita.	Spiritus juniperi compoſitus.
menthæ piperitidis ſimplex.	Aqua menthæ piperitidis.
ſpirituoſa.	Spiritus menthæ piperitidis.
vulgaris ſimplex.	Aqua menthæ ſativæ.
ſpirituoſa.	Spiritus menthæ ſativæ.
nucis moſchatæ.	nuclei fructus myriſticæ, ſive nucis moſchatæ.
piperis Jamaicenſis.	Aqua pimento.
pulegii ſimplex.	pulegii.
ſpirituoſa.	Spiritus pulegii.
raphani compoſita.	raphani compoſitus.
roſarum damaſcenarum.	Aqua roſæ.
ſapphirina.	cupri ammoniati.
ſeminum anethi.	anethi.
aniſi compoſita.	Spiritus aniſi compoſitus.
carui.	carui.
vitriolica camphorata.	Aqua zinci vitriolati cum camphora.
Argenti vivi purificatio.	Hydrargyri purificatio.
Axungiæ porcinæ curatio.	Adipis ſuillæ præparatio.

Names changed.	*New names.*
B.	
Balſamum ſulphuris barbadenſe.	Petroleum ſulphuratum.
ſimplex.	Oleum ſulphuratum.
traumaticum.	Tinctura benzoës compoſita.
C.	
Calx antimonii.	Antimonium calcinatum.
Cataplaſma e cymino.	Cataplaſma cumini.
Cauſticum antimoniale.	Antimonium muriatum.
commune fortius.	Calx cum kali puro.
lunare.	Argentum nitratum.
Ceratum album.	Ceratum ſpermatis ceti.
citrinum.	reſinæ flavæ.
epuloticum.	lapidis calaminaris.
Chalybis rubigo præparata.	Ferri rubigo.
Cinnabaris factitia.	Hydrargyrus ſulphuratus ruber.
Coagulum aluminoſum.	Cataplaſma aluminis.
Confectio cardiaca.	Confectio aromatica.
Cornu cervi calcinatio.	Cornu cervi uſtio.
D.	
Decoctum album.	Decoctum cornu cervi.
commune pro clyſtere.	pro enemate.
corticis peruviani.	cinchonæ ſive cortici peruviani.
pectorale.	hordei compoſitum.
E.	
Electuarium lenitivum.	Electuarium ſennæ.
Elixir aloës.	Tinctura aloës compoſita.
myrrhæ compoſitum.	ſabinæ compoſita.
paregoricum.	opii camphorata.
Emplaſtrum ex ammoniaco cum mercurio.	Emplaſtrum ammoniaci cum hydrargyro.
Emplaſtrum attrahens.	Emplaſtrum ceræ compoſitum.
cephalicum.	picis burgundicæ compoſitum.
commune.	lithargyri.
adhæſivum.	cum reſin
commune cum gummi.	lithargyri compoſitum.
commune cum mercurio.	lithargyri cum hydrargyro.
e cymino.	cumini.
roborans.	thuris compoſitum.
e ſapone.	ſaponis.
ſtomachicum.	ladani compoſitum.
veſicatorium.	cantharidis.
Emulſio communis.	Lac amygdalæ.

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Names changed.	*New names.*
Extractum cartharticum.	Extractum colocynthidis compoſitum.
ligni campechenſis.	hæmatoxyli ſive ligni campechiani.
corticis peruviani.	cinchonæ ſive corticis peruviani.
thebäicum ſive opium colatum.	Opium purificatum.
F.	
Flores benzöini.	Flores benzoës.
martiales.	Ferrum ammoniacale.
Fotus communis.	Decoctum pro fomento.
H.	
Hiera picra.	Pulvis aloës cum canella.
I.	
Infuſum amarum ſimplex.	Infuſum gentianæ compoſitum.
ſenæ communis.	ſennæ tartariſatum.
Julepum e camphora.	Miſtura camphorata.
e creta.	cretacea.
e moſcho.	moſchata.
L.	
Linimentum album.	Unguentum ſpermatis ceti.
ſaponaceum.	Linimentum ſaponis.
volatile.	ammoniæ.
Lixivium ſaponarium.	Aqua kali puri.
tartari.	kali præparati.
M.	
Mel ægyptiacum.	Oxymel æruginis.
roſaceum.	Mel roſæ.
Mercurius calcinatus.	Hydrargyrus calcinatus.
corroſivus ſublimatus.	muriatus.
ruber.	nitratus ruber.
dulcis ſublimatus.	Calomelas.
emeticus flavus.	Hydrargyrus vitriolatus.
præcipitatus albus.	Calx hydrargyri alba.
N.	
Nitrum vitriolatum.	Kali vitriolatum.
O.	
Oleum petrolei barbadenſis.	Oleum petrolei.
terebinthinæ æthereum.	terebinthinæ rectificatum.
Opium colatum.	Opium purificatum.
Oxymel ſcilliticum.	Oxymel ſcillæ.
ſimplex.	Mel acetatum.

000724

Names changed.	*New names.*
P.	
Philonium londinenſe.	Confectio opiata.
Pilulæ aromaticæ.	Pulvis aloëticus cum guaiaco.
ecphracticæ.	aloës cum ferro.
gummoſæ.	Pilulæ Galbani compoſitæ.
ruſi.	aloës cum myrrha.
Pulvis e bolo compoſitus.	Pulvis cretæ compoſitus.
cum opio.	cum opio.
e ceruſſa compoſitus.	ceruſſæ.
e chelis cancrorum compoſitus.	cancri chelarum compoſitus.
ſternutatorius.	aſari compoſitus.
R.	
Rob baccarum ſambuci.	Succus baccæ ſambuci ſpiſſatus.
S.	
Saccharum ſaturni.	Ceruſſa acetata.
Sal abſinthii.	Kali præparatum.
catharticus amarus.	Magneſia vitriolata.
glauberi.	Natron vitriolatum.
diureticus.	Kali acetatum.
martis.	Ferrum vitriolatum.
tartari.	Kali præparatum.
vitrioli.	Zincum vitriolatum.
volatilis ſalis ammoniaci.	Ammonia præparata.
Species aromaticæ.	Pulvis aromaticus.
Spiritus cornu cervi.	Liquor volatilis cornu cervi.
lavendulæ ſimplex.	Spiritus lavendulæ.
nitri dulcis.	ætheris nitroſi.
glauberi.	Acidum nitroſum.
ſalis ammoniaci.	Aqua ammoniæ.
ſalis ammoniaci dulcis.	Spiritus ammoniæ.
ſalis marini glauberi.	Acidum muriaticum.
vinoſus camphoratus.	Spiritus camphoratus.
vitrioli dulcis.	ætheris vitriolici.
volatilis aromaticus.	ammoniæ compoſitus.
fœtidus.	fœtidus.
Succi ſcorbutici.	Succus cochleariæ compoſitus.
Syrupus ex althæa.	Syrupus althææ.
e corticibus aurantiorum.	corticis aurantii.
balſamicus.	tolutanus.
e meconio.	papaveris albi.
roſarum ſolutivus.	roſæ.
T.	
Tabellæ cardialgicæ.	Trochiſci cretæ.
Tartarum emeticum.	Antimonium tartariſatum.
ſolubile.	Kali tartariſatum.

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Names changed.	*New names.*
Tartarum vitriolatum.	Kali vitriolatum.
Tinctura amara.	Tinctura gentianæ composita.
aromatica.	cinnamomi composita.
corticis peruviani simplex.	cinchonæ sive corticis peruviani.
corticis peruviani volatilis.	cinchonæ, sive corticis peruviani, ammoniata.
fœtida.	assæ fœtidæ.
florum martialium.	ferri ammoniacalis.
guaiacina volatilis.	guaiaci.
japonica.	catechu.
martis in spiritu salis.	ferri muriati.
melampodii.	hellebori nigri.
rhabarbari spirituosa.	rhabarbari.
vinosa.	Vinum rhabarbari.
rosarum.	Infusum rosæ.
sacra.	Vinum aloës.
stomachica.	Tinctura cardamomi composita.
thebaïca.	opii.
valerianæ volatilis.	valerianæ ammoniata.
Trochisci bechici albi.	Trochisci amyli.
nigri.	glycyrrhizæ.
V.	
Vinum antimoniale.	Vinum antimonii.
chalybeatum.	ferri.
Unguentum album.	Unguentum ceræ.
basilicum flavum.	resinæ flavæ.
cæruleum fortius.	hydrargyri fortius.
cæruleum mitius.	hydrargyri mitius.
e gummi elemi.	elemi compositum.
e mercurio præcipitato.	calcis hydrargyri albæ.
saturninum.	cerussæ acetatæ.
simplex.	adipis suillæ.
ad vesicatoria.	cantharidis.

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TABLE of Names changed, and of some Synonimes, in the last edition of the Edinburgh Pharmacopœia.

Names changed.	*New names.*
A.	
ABSINTHIUM.	ARTEMISIA abſinthium.
Acetoſa.	Rumex acetoſa.
Acetum vini.	Acidum acetoſum.
Acidum vitriolicum.	ſulphuricum.
vitrioli aromaticum.	aromaticum.
Ærugo.	Sub-Acetis cupri.
Æther vitriolicus.	Æther ſulphuricus.
Æthiops mineralis.	Sulphuretum hydrargyri nigrum.
Agaricus.	Boletus igniarius.
Alkali cauſticum.	Potaſſa.
fixum foſſile.	Carbonas ſodæ.
vegetabile.	potaſſæ impurus.
volatile.	ammoniæ.
Alumen.	Sulphas aluminæ.
uſtum.	exſiccatus.
Ammonia muriata.	Murias ammoniæ.
præparata.	Carbonas ammoniæ.
Amygdala dulcis.	Amygdalus communis.
Angelica ſativa.	Angelica Archangelica.
Aniſum.	Pimpinella aniſum.
Antimonium.	Sulphuretum antimonii.
calcareo-phoſphoratum.	Oxidum antimonii cum phoſphate calcis.
muriatum.	Murias antimonii.
tartariſatum.	Tartris antimonii.
Aqua ammoniæ.	Aqua carbonatis ammoniæ.
acetatæ.	acetitis ammoniæ.
cauſticæ.	ammoniæ.
cupri vitriolati compoſita, *vel* aqua ſtyptica.	Solutio ſulphatis cupri compoſita.
lixiviæ cauſticæ.	Aqua potaſſæ.
zinci vitriolati.	Solutio ſulphatis zinci.
Arabicum gummi.	Gummi mimoſæ niloticæ.
Argentum nitratum.	Nitras argenti.
Arſenicum.	Oxidum arſenici.

Names changed.	*New names.*
Aſſa fœtida.	Gummi-reſina ferulæ aſſæ fœtidæ.
Aurantium Hiſpalenſe.	Citrus aurantium.
Axungia porcina.	Adeps ſuis ſcrofæ.
B.	
Balſamum Canadenſe.	Reſina liquida pini balſameæ.
Copaibæ.	copaiferæ officinalis.
Gileadenſe.	amyridis Gileadenſis.
Peruvianum.	Balſamum myroxyli peruiferi.
Tolutanum.	toluiferæ balſami.
traumaticum.	Tinctura benzoin compoſita.
Bardana.	Arctium lappa.
Barilla.	Carbonas ſodæ impurus.
Barytes.	barytæ.
Belladonna.	Atropa belladonna.
Benzoinum.	Balſamum ſtyracis benzoin.
Biſtorta.	Polygonum biſtorta.
Borax.	Boras ſodæ.
Butyrum antimonii.	Murias antimonii.
C.	
Cajeputa.	Melaleuca leucadendron.
Calamus aromaticus.	Acorus calamus.
Calomelas.	Sub-Murias hydrargyri.
Calx viva.	Calx.
Cancrorum lapilli.	Carbonas calcis durior.
Cantharis.	Meloë veſicatorius.
Cardamomum minus.	Amomum repens.
Carduus benedictus.	Centaurea benedicta.
Carica.	Fructus ficûs caricæ.
Carvi.	Carum carui.
Caryophylla aromatica.	Caryophyllus aromaticus.
rubra.	Dianthus caryophyllus.
Caſcarilla.	Croton eleutheria.
Caſſia fiſtularis.	Caſſia fiſtula.
lignea.	Laurus caſſia.
Catechu.	Mimoſa catechu.
Cauſticum commune acerrimum.	Potaſſa.
mitius.	cum calce.
lunare.	Nitras argenti.
Centaurium minus.	Chironia centaurium.
Ceruſſa.	Oxidum plumbi album, *vel* carbonas plumbi.
acetata.	Acetis plumbi.
Chamæmelum.	Anthemis nobilis.
Cicuta.	Conium maculatum.
Cinnabaris factitia.	Sulphuretum hydrargyri rubrum.
Cinara hortenſis.	Cinara ſcolymus.
Cineres clavellati.	Carbonas potaſſæ impurus.
Cinnamomum.	Laurus cinnamomum.

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Names changed.	*New names.*
Coccinella.	Coccus cacti.
Colocynthis.	Cucumis colocynthis.
Confectio japonica.	Electuarium mimoſæ catechu.
Contrayerva.	Dorſtenia contrayerva.
Cortex peruvianus.	Cortex cinchonæ officinalis.
Creta alba.	Carbonas calcis mollior.
Crocus antimonii. metallorum.	Oxidum antimonii cum ſulphure per nitratem potaſſæ.
Cryſtalli tartari.	Super-Tartris potaſſæ.
Cucumis agreſtis.	Momordica elaterium.
Cuprum ammoniacum.	Ammoniaretum cupri.
vitriolatum.	Sulphas cupri.
Cynoſbatos.	Roſa canina.
D.	
Daucus ſilveſtris.	Daucus carota.
Decoctum chamæmeli *vel* commune.	Decoctum anthemidis nobilis.
lignorum.	guaiaci compoſitus.
Dens leonis.	Leontodon taraxacum.
E.	
Elaterium.	Succus ſpiſſatus momordicæ elaterii.
Electuarium lenitivum.	Electuarium caſſiæ ſennæ.
Elixir paregoricum.	Tinctura opii ammoniata.
ſacrum.	rhei et aloës.
ſalutis.	ſennæ compoſita.
ſtomachicum.	gentianæ compoſita.
Emplaſtrum adhæſivum.	Emplaſtrum reſinoſum.
cereum.	ſimplex.
lithargyri *vel* commune.	oxidi plumbi ſemivitrei.
lithargyri compoſitum *vel* roborans.	oxidi ferri rubri.
veſicatorium.	meloës veſicatorii.
Emulſio communis.	Emulſio amygdalæ communis.
F.	
Ferrum ammoniatum.	Carbonas ferri.
Ferri rubigo.	Ferri oxidum nigrum purificatum.
ſquamæ purificatæ.	præparatum.
præparatæ.	Murias ammoniæ et ferri.
Ferrum vitriolatum.	Sulphas ferri.
uſtum.	Oxidum ferri rubrum.
Filix mas.	Polypodium filix mas.
Flores martiales.	Murias ammoniæ et ferri.
ſulphuris.	Sulphur ſublimatum.
zinci.	Oxidum zinci.
Fœniculum dulce.	Anethum fœniculum.

Names changed.	*New names.*
G.	
Galbanum.	Gummi-reſina bubonis galbani.
Geniſta.	Spartium ſcoparium.
Granata malus.	Punica granatum.
Gummi Arabicum.	Gummi mimoſæ Niloticæ.
H.	
Helleborus albus.	Veratrum album.
Hepar ſulphuris.	Sulphuretum potaſſæ.
Hippocaſtanum.	Æſculus hippocaſtanum.
Hydrargyrus acetatus.	Acetis hydrargyri.
muriatus corroſivus.	Murias hydrargyri.
mitis.	Sub-Murias hydrargyri, ſive calomelas.
præcipitatus.	Sub-Murias hydrargyri præcipitatus.
nitratus ruber.	Oxidum hydrargyri rubrum per acidum nitricum.
præcipitatus cinereus.	Oxidum hydrargyri cinereum.
ſulphuratus niger.	Sulphuretum hydrargyri nigrum.
vitriolatus flavus.	Sub-Sulphas hydrargyri flavus.
I.	
Infuſum amarum.	Infuſum gentianæ compoſitum.
roſarum.	roſæ Gallicæ.
J.	
Jalapa.	Convolvulus jalapa.
L.	
Lapis calaminaris.	Carbonas zinci impurus.
Lavendula.	Lavandula ſpica.
Laudanum liquidum.	Tinctura opii.
Lignum Campechenſe.	Lignum Hæmatoxyli Campechiani.
Limon.	Citrus medica.
Linimentum anodynum *vel* opiatum.	Tinctura ſaponis et opii.
ſaponaceum.	Tinctura ſaponis.
volatile.	Oleum ammoniatum.
Lithargyrus.	Oxidum plumbi ſemivitreum.
Lixiva acetata.	Acetis potaſſæ.
e tartaro.	Carbonas potaſſæ puriſſimus.
purificata.	Carbonas potaſſæ.
tartariſata.	Tartris potaſſæ.
vitriolata.	Sulphas potaſſæ.
ſulphurea.	cum ſulphure.
Lixivium cauſticum.	Aqua potaſſæ.

Names changed.	*New names.*
M.	
Magneſia alba.	Carbonas magneſiæ.
uſta.	Magneſia.
vitriolata.	Sulphas magneſiæ.
Majorana.	Origanum majorana.
Manna.	Succus concretus fraxini orni.
Marmor album.	Carbonas calcis durior.
Maſtiche.	Reſina piſtachiæ lentiſci.
Melampodium.	Helleborus niger.
Mercurius.	Hydrargyrus.
præcipitatus ruber.	Oxidum hydrargyri rubrum.
ſublimatus corroſivus.	Murias hydrargyri.
Mezereum.	Daphne mezereum.
Minium.	Oxidum plumbi rubrum.
Muria.	Murias ſodæ.
N.	
Naſturtium aquaticum.	Siſymbrium naſturtium.
Nitrum.	Nitras potaſſæ.
Nux moſchata.	Nucleus fructûs myriſticæ moſchatæ.
O.	
Olea ſtillatitia.	Olea volatilia.
Oleum ſuccini rectificatum.	Oleum ſuccini puriſſimum.
terebinthinæ rectificatum.	volatile pini puriſſimum.
Olibanum.	Gummi-reſina juniperi lyciæ.
Oliva.	Olea Europæa.
P.	
Palma.	Cocos butyracea.
Patroleum Barbadenſe.	Bitumen petroleum.
Petroſelinum.	Apium petroſelinum.
Pilulæ cupri.	Pilulæ ammoniareti cupri.
thebaicæ.	opiatæ.
Pimento *vel* piper Jamaicenſis.	Myrtus pimenta.
Piper Indicum.	Capſicum annuum.
Pix Burgundica.	Reſina ſponte concreta pini abietis.
liquida.	empyreumatica pini ſylveſtris.
Plumbum uſtum.	Oxidum plumbi ſemivitreum.
Potio cretacea.	Potio carbonatis calcis.
Prunus Gallica.	Prunus domeſtica.
Pulegium.	Mentha pulegium.
Pulvis antimonialis.	Oxidum antimonii cum phoſphate calcis.
cretaceus.	Pulvis carbonatis calcis compoſitus.
Doveri.	ipecacuanhæ et opii.
Pyrethrum.	Anthemis pyrethrum.

Names changed.	*New names.*
R.	
Raphanus ruſticanus.	Cochlearia armoracia.
Reſina alba.	Reſina pini.
Rhabarbarum.	Rheum palmatum.
Roſa pallida.	Roſa centifolia.
rubra.	Gallica.
Rubigo ferri præparata.	Carbonas ferri præparatus.
S.	
Sabina.	Juniperus ſabina.
Saccharum ſaturni.	Acetis plumbi.
Sal alkalinus fixus foſſilis.	Carbonas ſodæ.
vegetabilis.	potaſſæ.
ammoniacus.	Murias ammoniæ.
catharticus amarus.	Sulphas magneſiæ.
cornu cervi.	Carbonas ammoniæ.
Glauberi.	Sulphas ſodæ.
marinus Hiſpanus.	Murias ſodæ.
polychreſtus.	Sulphas potaſſæ cum ſulphure.
Rupellenſis.	Tartris potaſſæ et ſodæ.
ſuccini.	Acidum ſuccinicum.
tartari.	Carbonas potaſſæ puriſſimus.
Sanguis draconis.	Reſina pterocarpi draconis.
Santalum rubrum.	Pterocarpus ſantalinus.
Santonicum.	Artemiſia ſantonicum.
Sarſaparilla.	Smilax ſarſaparilla.
Saſſafras.	Laurus ſaſſafras.
Scammonium.	Gummi-reſina convolvuli ſcammoniæ.
Seneka.	Polygala ſenega.
Senna.	Caſſia ſenna.
Serpentaria Virginiana.	Ariſtolochia ſerpentaria.
Simarouba.	Quaſſia ſimaruba.
Sinapi album.	Sinapis alba.
Soda.	Carbonas ſodæ.
muriata.	Murias ſodæ.
phoſphorata.	Phoſphas ſodæ.
tartariſata.	Tartris potaſſæ et ſodæ.
vitriolata.	Sulphas ſodæ.
Spiritus ætheris vitriolici.	Æther ſulphuricus cum alcohole.
ammoniæ.	Alcohol ammoniatum.
cornu cervi.	Aqua carbonatis ammoniæ.
Mindereri.	acetitis ammoniæ.
ſalis ammoniaci.	carbonatis ammoniæ.
vinoſus rectificatus.	Alcohol.
tenuior.	dilutum.
camphoratus.	Tinctura camphoræ.
Staphiſagria.	Delphinium ſtaphiſagria.
Stramonium.	Datura ſtramonium.

Names changed.	*New names.*
Sulphur antimonii præcipitatum. } auratum antimonii. }	Sulphuretum antimonii præcipitatum.
Syrupus balſamicus *vel* Tolutanus.	Syrupus toluiferæ balſami.
papaveris albi.	papaveris ſomniferi.
T.	
Taraxacum.	Leontodon taraxacum.
Tartarus crudus.	Super-Tartris potaſſæ impurus.
Tartari cryſtalli.	potaſſæ.
Tartarum ſolubile.	Tartris potaſſæ.
vitriolatum.	Sulphas potaſſæ.
Tartarus emeticus.	Tartris antimonii.
Terebinthina Veneta.	Reſina liquida pini laricis.
Terra Japonica.	Extractum mimoſæ catechu.
ponderoſa vitriolata.	Sulphas barytæ.
Tinctura aloës vitriolata.	Tinctura aloës ætherea.
aromatica.	cinnamomi compoſita.
ferri.	muriatis ferri.
cantharidum.	meloës veſicatorii.
Japonica.	mimoſæ catechu.
rhei amara.	rhei et gentianæ.
ſacra.	Vinum aloës ſocotorinæ.
Tolutana.	Tinctura toluiferæ balſami.
Toxicodendron.	Rhus toxicodendron.
Tragacantha.	Aſtragalus tragacantha.
Trifolium.	Menyanthes trifoliata.
Trochiſci Arabici.	Trochiſci gummoſi.
Turpethum minerale.	Sub-Sulphas hydrargyri flavus.
Tutia.	Oxidum zinci impurum.
U.	
Unguentum album *vel* ceruſſæ.	Unguentum oxidi plumbi albi.
æruginis.	ſub-Acetitis cupri.
cœruleum.	hydrargyri.
citrinum.	nitratis hydrargyri.
epiſpaſticum fortius.	pulveris meloës veſicatorii.
mitius.	infuſi meloës veſicatorii.
ſaturninum.	acetitis plumbi.
tutiæ.	oxidi zinci impuri.
Uva paſſa.	Fructus ſiccatus vitis viniferi.
urſi.	Arbutus uva urſi.
V.	
Valeriana ſylveſtris.	Valeriana officinalis.
Vinum amarum.	Vinum gentianæ compoſitum.
antimoniale.	tartritis antimonii.
Vitriolum album.	Sulphas zinci.
cœruleum.	cupri.

Names changed.	*New names.*
Vitriolum viride.	Sulphas ferri.
Vitrum antimonii.	Oxidum antimonii cum sulphure vitrificatum.
ceratum.	antimonii vitrificatum cum cera.
W.	
Winteranus cortex.	Cortex Winteræ aromaticæ.
Z.	
Zincum ustum.	Oxidum zinci.
vitriolatum.	Sulphas zinci.
Zingiber.	Amomum zingiber.

NOTE.—(*Edin.*) In both these Indexes of changed names, (fearing lest they might become too long, and satisfied if every possible error might be avoided), we have only introduced those simples of which we have changed the principal and common names, called in natural history Generic names; such as, Anthemis nobilis for Chamæmelum, Chironia Centaureum for Centaurium minus, Convolvulus Jalapa for Jalapa; but we have omitted all those simples whose former generic names remain, and to which we have only added their specific or trivial names, such as, Digitalis purpurea, Rheum palmatum, Papaver somniferum.

For the same reason, we have thought it sufficient to introduce into these Indexes the changed name of every simple, having generally omitted the titles of the preparations and compositions which are formed of them. Thus, we have mentioned, that Laurus Cinnamomum is to be used in place of Cinnamomum; but we have omitted the Aqua, Spiritus, and Tinctura Lauri Cinnamomi, trusting that their new names cannot be a source of doubt or error to any person.

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